DOCUMENT RESUME

ED 200 566 SP 017 856

TITLE	Health, United States, 1980, With Prevention Profile.
INSTITUTION	National Center for Health Statistics (DHEW/PHS), Hyattsville, Md.
REPORT NO	DHHS-PHS-81-1232
PUB DATE	Dec 80
NOTE	325p.
EDRS PRICE	MF01/PC13 Plus Postage.
DESCRIPTORS	Cost Estimates; *Disease Control; *Disease Incidence; Futures (of Society); Health Conditions; Health Facilities; Health Needs; *Health Services; *Medical Care Evaluation; *National Norms; Patient Education; *Physical Health; Public Health Legislation

ABSTRACT

The first part of this report consolidates the most current data on health care trends and presents analytical discussions on four interrelated themes: health status and determinants; utilization of health resources; health care resources; and health care expenditures. Detailed tables present statistics showing comparisons over time for such topics as fertility, mortality, inpatient care, health care personnel, and sources and types of payment. A glossary of terms is supplied, and the sources of data are reviewed. The second part of the report, entitled Prevention Profile, contains information on the incidence of, and trends in preventable causes of death and disability in the United States. Articles discuss the physical and economic burdens that could be reduced by disease prevention; successes, failures, and gaps in prevention and control; and tracking future progress in reducing risks. (FG)

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THE PREVENTION PROFILE

ED200566

Health United States 1980

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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Office of Health Research, Statistics, and Technology

SP 017856

Health United States 1980

with PREVENTION PROFILE

DHHS Publication No. (PHS) 81-1232

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Office of Health Research, Statistics, and Technology
National Center for Health Statistics
National Center for Health Services Research

Hyattsville, Maryland
December 1980

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Foreword

Health, United States, 1980 is the fifth annual report on the health status of the Nation submitted by the Secretary of Health and Human Services to the President and Congress of the United States in compliance with Section 308 of the Public Health Service Act. It presents statistics concerning recent trends in the health care sector and detailed discussions of selected current health issues.

This report was compiled by the National Center for Health Statistics with the assistance of the National Center for Health Services Research, Office of Health Research, Statistics, and Technology. The National Committee on Vital and Health Statistics served in a review capacity.

This volume contains *Prevention Profile*, submitted by the Secretary of the Department of Health and Human Services to the President and the Congress of the United States for the first time this year, and every third year hereafter, in compliance with Section 404 of Title IV of the Health Services and Centers Amendments of 1978 (Public Law 95-626). This profile provides a data base for the effective implementation of the disease prevention and health promotion aspects of this legislation. It also serves to increase public awareness of the prevalence, incidence, and trends in preventable causes of death and disability in the United States. Although the legislation gave primary responsibility for preparation of the profile to the National Center for Health Statistics, it was developed in cooperation with the Office of Disease Prevention and Health Promotion. This first profile is an integral part of the Department's Health Initiative which was outlined in *Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention* and later described in more detail in *Promoting Health/Preventing Disease: Objectives for the Nation.* Future editions of *Prevention Profile* will serve as the basic mechanism for tracking these objectives.

This volume is divided into two parts. Part 1 is *Health, United States*, which includes (a) several analytic articles on subjects of current interest in the health field; (b) a section of 78 detailed tables; (c) appendixes containing descriptions of the data sources and a glossary of terms; and (d) a guide to the detailed tables. Part 2 is *Prevention Profile.*

The analytic articles and detailed tables in Part 1 are organized around four major themes:

- Health Status and Determinants
- Utilization of Health Resources
- Health Care Resources
- Health Care Expenditures

This edition of *Health, United States* continues the approach introduced in last year's volume by emphasizing trends and comparisons over time rather than cross tabulations of several variables for a single data year. This improves the usefulness of the volume by making it a standard reference source that illustrates changes in health status and the health care system. Future editions will be updated with more recent data years using similar tables.

Once again, the detailed tables emphasize age-adjusted data. This was necessary for two reasons: (1) the elderly constitute a growing proportion of the U.S. population, and (2) several demographic subgroups of the population have different age structures. By adjusting for age, data can be compared more easily over time and for different groups.

Although the articles and tables are divided into separate topical sections, the trends considered under different aspects of the health care system are not independent. Strong interrelationships exist, and a change in one area of the health care system may affect other areas. However, only some of these interrelationships are examined in this report.

Acknowledgments

Overall responsibility for planning and coordinating the content of this volume rested with the Division of Analysis, National Center for Health Statistics, under the supervision of Jacob J. Feldman, Joel C. Kleinman, Barbara G. Weichert, and Ronald W. Wilson. Coordination of those sections contributed by the National Center for Health Services Research was the responsibility of James C. Daugherty, Donald E. Goldstone, and Mark C. Hornbrook.

Within the Division of Analysis, Rebecca A. Placek coordinated production of *Health, United States*, and Jacqueline A. Smith coordinated production of *Prevention Profile*. Statistical review was provided by Barbara G. Weichert, with the assistance of Mitchell B. Pierre, Jr., and Dawn M. Rubin.

Editorial planning and review were provided by Margot A. Kemper, Gerri A. Michael, and John E. Mounts. Final production of this volume was managed by Thomas W. Poore, with the assistance of Linda L. Holt. Production was accomplished by Jarmila G. Frazier, Annette F. Gaidurgis, Cecelia R. Mutchler, Ronald Scott, and Eugene Starnowsky.

The authors of each article and the *Prevention Profile* are identified in their respective sections.

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Symbols

- - -	Data not available
. . .	Category not applicable
-	Quantity zero
0.0	Quantity more than 0 but less than 0.05
*	Figure does not meet standards of reliability or precision

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Highlights

I. Health Status and Determinants

- The fertility of American women remained at a low level in 1978—66.6 births per 1,000 women 15-44 years of age.
- Not only are women having fewer births, but many are also postponing them; the birth rate for women 20-24 years of age is now equal to that for women 25-29 years of age, and first births for women 30-34 years of age have increased sharply.
- In 1978, there were 32.9 births per 1,000 women 15-17 years of age, compared with 38.8 births per 1,000 in 1970.
- Although the differential has narrowed since 1970, the birth rate for black teenagers 15-17 years of age in 1978 was three times that of white teenagers in the same age group.
- Life expectancy at birth continued to increase, reaching a record 73.3 years in 1978; the difference between life expectancy for white people and all other people has narrowed, but it still remains large at 5 years.
- The relative difference between male and female mortality has been increasing; the ratio of the age-adjusted death rate for males to that for females increased from 1.5 in 1950 to 1.8 in 1978.
- From 1970 to 1978, heart disease mortality decreased by the same amount—18 percent—as it did the 20 years between 1950 and 1970.
- Stroke mortality decreased by a greater amount from 1970 to 1978 than it did the 20 years between 1950 and 1970—33 percent, compared with 25 percent; this recent decline has been especially large for black people who are about 60 percent more likely to die of stroke than are white people.
- Although it has been known for several years that control of severe hypertension leads to reduced mortality, a clinical trial completed in 1979 provided convincing evidence that control of even mild hypertension leads to reduced mortality.
- Cancer mortality has continued to decrease for people under 45 years of age and has recently begun to decline for those 45-49 years of age.
- During the 1970's, respiratory cancer death rates increased for men and women, but the rate of increase was greater for females; if current trends continue, lung cancer will replace breast cancer as the leading cause of cancer mortality among women.
- Following a sustained decrease in motor vehicle accident mortality from 1968 to 1976, the age-adjusted death rate for motor vehicle accidents increased 4 percent between 1976 and 1977 and 7 percent between 1977 and 1978.
- After a steady increase since the early 1960's, the age-adjusted death rate for homicide has declined slightly since its record peak in 1974; this resulted from a sizable decrease in the rate for black people who are about six times more likely than white people to be victims of homicide.
- Following a general increase in the age-adjusted suicide rate during the 1970's, the rate declined by 5 percent between 1977 and 1978.
- The infant mortality rate in 1979 was 13 deaths per 1,000 live births, a 47-percent decline since 1965.
- Although infant mortality has been decreasing for all races, black newborns are nearly twice as likely to die during infancy as their white counterparts.
- Both white and black infant mortality rates were about 50 percent greater in the States with the highest rates than in the States with the lowest rates.
- One of the major factors contributing to the

decline in infant mortality and especially neonatal mortality is the greatly improved survival for infants of low birth weight; about 50 percent of the reduction in neonatal mortality among white infants and 60 percent of the reduction among black infants was because of improved survival for infants weighing between 1,001 and 2,500 grams.

II. Utilization of Health Resources

- Between 1964 and 1978, a marked trend toward equality in the volume of physician visits between the poor and nonpoor was evident, although no convincing evidence exists that the level of use was commensurate with need.
- The poor continued to use considerably fewer dental services than the nonpoor; in 1978, half the population with family incomes below $7,000 had no dental care during the 2 years preceding interview, compared with one-third of those people with higher family incomes.
- From 1963-65 to 1976-78, the rate of surgery for children declined, but it increased for adults, especially those 65 years of age and over.
- For the period 1976-78, the North Central and South Regions generally had higher rates of surgery than the Northeast and West Regions.
- In nearly every age group and geographic region, surgical utilization increased more rapidly for the poor than the nonpoor from 1963-65 to 1976-78.
- In a comparison among 10 selected countries, the United States, Australia, and Canada had the highest hospital discharge rates and the shortest mean lengths of stay.
- The mean length of a hospital stay for people 65 years of age and over was more than 5 days shorter in the United States than in seven other countries.
- The mean length of a hospital stay in the United States decreased from 8.5 days to 7.4 days in the 10-year period from 1968 to 1978; this represented an overall decrease of 13 percent.
- Although all four geographic regions experienced decreases in lengths of stay, regional variation was more apparent in 1978 than in 1968; the Northeast had the longest stays and the West had the shortest stays.
- The mean length of a hospital stay for acute myocardial infarction (heart attack) dropped from 19.2 days in 1971 to 13.8 days in 1978—a reduction of 28 percent.
- Between 1970 and 1978, the rate of cesarean section deliveries nearly tripled to 15.2 per 100 deliveries, or more than one-half million births.
- Although the United States had the highest cesarean section rate when compared to five other countries for which data were available, all countries showed sharp increases in cesarean section deliveries.
- The uniformity of the increase in cesarean sections by maternal and hospital characteristics suggests that a fundamental and widespread change in obstetrical practice has taken place.
- Although a great deal of change in the age-parity composition of live births occurred, this change accounted for only 5 percent of the increase in cesarean section deliveries.

III. Health Care Resources

- Between 1970 and 1979, the number of active physicians (M.D.'s) per 10,000 population increased 25 percent to 19.3.
- The physician supply is expected to grow rapidly in the coming years, increasing 37 percent between 1979 and 1990 to nearly 600,000 physicians, or 23.9 physicians per 10,000 population.
- Although the physician supply has recently been increasing in nonmetropolitan as well as in metropolitan areas, in 1978, the patient care physician-to-population ratio in nonmetropolitan areas was 7.4 per 10,000, compared with 17.1 per 10,000 in metropolitan areas.
- Public and private initiatives have stimulated physician interest in primary care specialties; family practitioners are expected to increase from 3 percent of all physicians in 1975 to 10 percent by 1990.
- Regional variation in the supply of patient care physicians decreased between 1973 and 1978; however, the Northeast Region still had 37 percent more patient care physicians per 10,000 population than the South and North Central Regions.
- While the number of community hospitals was practically unchanged between 1973 and 1978, their numbers of beds, admissions, average daily census, and outpatient services substantially increased; however, occupancy rates decreased during this period.
- In 1978, 36 States had higher bed-to-population ratios and 46 States had lower occupancy rates than those recommended in the Department of Health and Human Service's National Guidelines for Health Planning.

- In 1976, the number of nursing home beds per 1,000 persons 65 years of age and over varied from 77 in the North Central Region to 51 in the South Region.

IV. Health Care Expenditures

- Health care expenditures are continuing their rapid rise, reaching $212.2 billion, or 9.0 percent of the gross national product for 1979; this represents an increase of 12.5 percent over that for the previous year.
- Expenditures for hospital care continued to account for the largest portion of the health care dollar—40.2 percent in 1979; physician services accounted for 19.1 percent, followed by nursing home care (8.4 percent), drugs and drug sundries (8.0 percent), and dentist services (6.4 percent).
- During the past three decades, hospital care and nursing home care have increased as a proportion of total health care expenditures, while physician services, drugs and drug sundries, and dentist services have decreased.
- Medical care prices more than doubled during the period 1970 to 1979; price increases alone accounted for more than two-thirds of the increase in health expenditures in 1979.
- Hospital service charges generally led the increase in medical care prices, with annual increases in excess of 10 percent during the period 1970 to 1979.
- Third party payment for medical care services increased from 48 percent to 80 percent during the period 1966 to 1977; currently, approximately 90 percent of the population has some form of health insurance coverage.
- The number of employees per patient day in community hospitals increased by 19 percent between 1971 and 1978.
- Hospital real assets per bed increased by 28 percent during the period 1971 to 1977; hospital real assets per 1,000 population increased 37 percent during this period.
- Occupation-specific, quality-adjusted wages in the health care sector rose relative to other industries until 1972, after which these wages did not keep pace with other industries.
- Hospitals have markedly increased their reliance on debt financing of capital projects—from 35 percent in 1969 to 63 percent in 1977.

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Section I

Health Status and Determinants

Trends in Fertility[a]

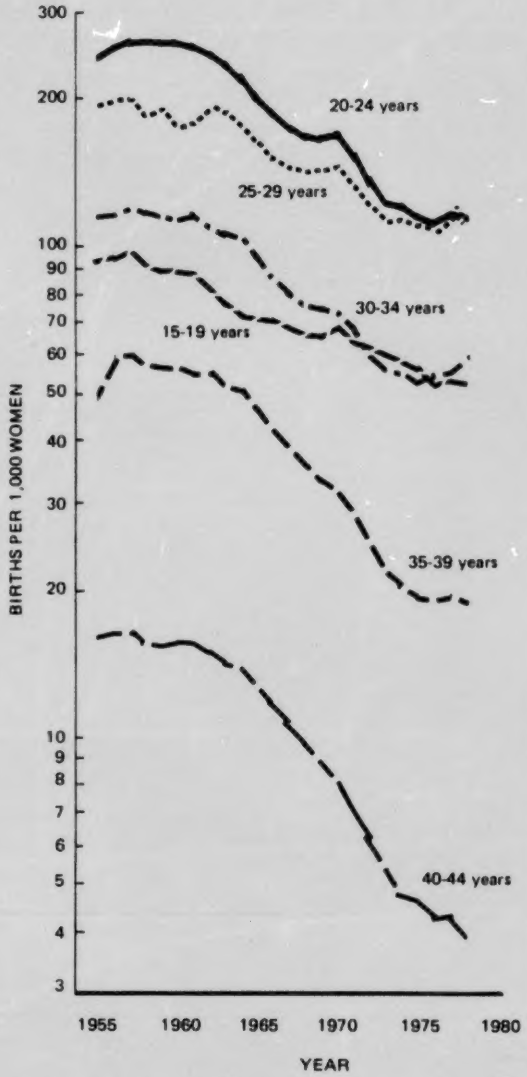
Introduction

The fertility of American women has declined substantially during the past 25 years. From 1955 to 1978, the crude birth rate decreased by 39 percent, from 25.0 to 15.3 births per 1,000 population, and the fertility rate decreased by 44 percent, from 118.3 to 66.6 births per 1,000 women 15-44 years of age.

Not only are women having fewer births, but many seem to be postponing them as well. Age-specific birth rates have traditionally been highest for women 20-24 years of age. However, in recent years, these rates have been converging with those for women 25-29 years of age. While fertility has been declining for both age groups, the decline for younger women has been more rapid. By 1978, the age-specific birth rates were virtually the same for each age group (figure 1). Moreover, although still substantially lower than for women in their twenties, births to women 30-34 years of age have been increasing since 1975.

This pattern is even more pronounced when looking at age-specific rates for first births only (figure 2). While first births for women 20-24 years of age have shown a substantial decline through the 1970's, those for women 25-29 and 30-34 years of age have increased markedly. The phenomenon of delayed childbearing is not as apparent for black women as it is for white women. Although birth rates for black women in the 20-24 years of age group have shown a marked decline while those for the 25-29 and 30-34 years of age groups have increased slightly since 1975, rates for the women in the youngest age group remain substantially higher.

Women are also completing childbearing at earlier ages, further reducing the span of childbearing years and thus, their fertility. Fertility decline has been highest for women over 35 years of age, with the magnitude of decline progressively larger for each 5-year age group. Currently, birth rates for these women are at extremely low levels. This applies to



SOURCE: National Center for Health Statistics: *Vital Statistics of the United States, 1978*, Vol. I. Public Health Service, DHHS, Hyattsville, Md. To be published.

Figure 1. Age-specific birth rates: United States, 1955-78

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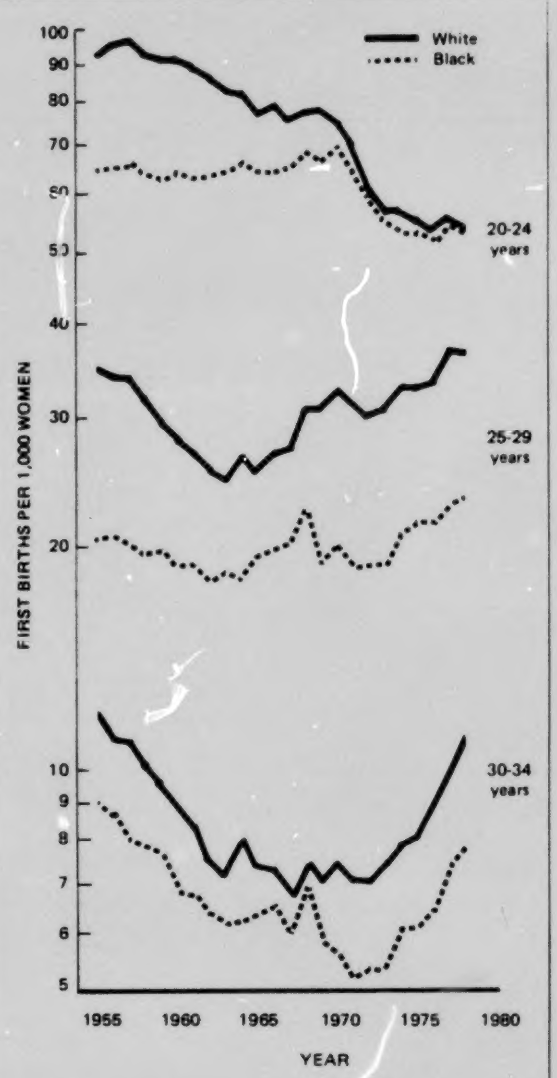
[a] Prepared by Barbara G. Weichert, National Center for Health Statistics.



SOURCE: National Center for Health Statistics: *Vital Statistics of the United States, 1978*, Vol. I. Public Health Service, DHHS, Hyattsville, Md. To be published.

Figure 2. First births, according to race and selected ages: United States, 1955-78

both white and black women, with the rates for the latter somewhat higher.

While both white and black women have experienced declining fertility, sizable differentials still exist between the two groups. Birth rates for black women have been substantially greater than those for white women. These differences are particularly large for third and higher order births. An interesting exception occurs for the 25-29 and 30-34 years of age groups as the result of the delayed childbearing among white women. Since 1970, black women 25-29 years of age have been experiencing lower fertility than white women of the same age, and the rates for each race in the 30-34 years of age group have become more similar.

The largest racial differentials occur among teenagers. Teenage pregnancy has been a topic of concern to public health officials for many years because of negative health and social consequences for both the mother and child. The remainder of this section will concentrate on trends in teenage fertility and their implications.

Teenage Fertility

In 1978, there were more than 500,000 births to women under 20 years of age, representing more than 16 percent of all births. Teenagers 15-17 years of age accounted for 6 percent of all births and those 18-19 years of age accounted for 10 percent. Births to teenagers under 15 years of age accounted for only 0.3 percent of total births. Moreover, the absolute number of births for the youngest teenagers was small compared with teenagers 15-19 years of age—10,772 and 543,407 births, respectively.

Large differentials in teenage childbearing exist between the races (table 4). In 1978, the birth rate for black teenagers 15-17 years of age was three times that of white teenagers in the same age group. For those 18-19 years of age, the rate for black women was double the rate for white women. The largest differential occurred for teenagers under 15 years of age, with the birth rate for black teenagers seven times that of white teenagers. These differentials were also evident for teenage births as a proportion of total births. For example, births to black women 15-17 years of age accounted for more than 12 percent of total births to black women, while those for white women of the same age accounted for about 5 percent of total white births.

Declines in fertility during the 1970's have been more rapid for black teenagers, somewhat narrowing the differential between black and white women under 20 years of age. After a slight increase in the early 1970's, the birth rate for black teenagers 10-14 years of age began to decline, while the rate for white teenagers in this age group remained about the same. The fertility of both white and black teenagers 15-17 years of age also increased slightly during the early 1970's, but it declined between 1973 and 1978 at an average annual rate of 4.6 percent for black teenagers and 2.9 percent for white teenagers. The fertility of the 18-19 years of age group for both races declined from 1970 to 1978 at similar rates—4.2 percent for black women and 4.5 percent for white women.

While teenage fertility rates have fallen since the early 1970's, the rate of decline has been slow relative to women in their early twenties. This is particularly true of the rates for younger teenagers. The rate of decline for women 18-19 years of age more closely paralleled that of women 20-24 years of age.

Despite the overall decline in recent years, teenage fertility in the United States is still considered to be at a high level. When compared with 12 other industrialized countries, the teenage birth rate in the United States is among the highest, even when white women alone are considered (table A). The virtual absence of teenage births in Japan is especially notable. While Japan's extremely low birth rate for women 15-19 years of age may be attributed primarily to cultural factors, it has also shown a considerable decline since 1955.

Sexual Activity and Contraceptive Practice

According to the results of two national surveys conducted in 1971 and 1976, premarital sexual activity among women 15-19 years of age is increasing. Proportionately more teenage women are having sexual relations, and their first exposure occurs at younger ages. This increase has been more rapid for white teenagers although premarital sexual activity is still more prevalent among black teenagers (Zelnik and Kantner, 1977).

A substantial increase has also occurred in the proportion of teenage women who use contraception consistently and in those who use the more effective medical methods such as the birth control pill and the intrauterine device. However, as of 1976, 28 percent of sexually active white teenagers and 43 percent of black teenagers did not use contraceptives (Zelnik and Kantner, 1978). The major reasons for nonuse included the unanticipated nature of many teenage sexual encounters and misinformation about the risks of pregnancy. Many teenagers had inadequate knowledge about the menstrual cycle and when conception was most likely to occur or believed themselves protected against pregnancy by their youth or infrequency of intercourse (Zelnik and Kantner, 1979).

Apparently, teenage women are not relying on abortion as a substitute for contraception. Among teenagers who become pregnant unintentionally, those who choose abortion are no less likely to have been practicing contraception prior to pregnancy than those who continue their pregnancy (Zelnik and Kantner, 197[illegible]). However, approximately 30 percent of all abortions are performed on young women less than 20 years of age (table 5), compared with 16 percent of all live births for the same age group.

Health Risks

Teenage women are at higher risk of various complications of pregnancy such as toxemia and prolonged labor than are women in their twenties. These problems are related to several factors including poor nutrition, physical immaturity, and inadequate prenatal care (Baldwin, 1976). The incidence of delay or absence of prenatal care for teenagers is greater than for older mothers and more pronounced the younger the teenager is (National Center for Health Statistics, 1977). Singly or in combination, these factors present a serious health risk, not only to the young mother, but also to her infant.

One of the most serious problems of teenage pregnancy is the high incidence of infants weighing 2,500 grams or less at birth. Low birth weight and infant mortality tend to occur together. In addition, low birth weight has also been linked with developmental problems such as epilepsy, cerebral palsy, and mental retardation (Stewart, 1977).

A higher proportion of low-birth-weight infants are born to teenage mothers than to mothers in their twenties (table B). Moreover, substantial differences exist between white and black women, not only for teenage births but for births to older women as well. For example, the proportion of low-birth-weight infants born to white mothers less than 15 years of age (10.9 percent) is lower than the proportion born to black mothers in the same age group (16.9 percent); it is also lower than the proportion born to black mothers 25-29 years of age (11.4 percent).

Health problems related to teenage pregnancy, for both mother and infant, increase in prevalence the younger the teenager is. Moreover, these problems also increase with parity. For example, while the risk

Table A. Birth rates and percent of all births for women under 20 years of age: Selected countries, selected years 1972-1976

Country and year	*Births per 1,000 women under 20 years*	*Percent of all births*
Canada (1975)	33.8	11.0
United States (1976)[1]	54.7	18.0
Sweden (1976)	25.0	6.6
England and Wales (1976)	32.4	9.9
Netherlands (1976)	11.3	3.7
German Democratic Republic (1975)	61.6	21.8
German Federal Republic (1976)	19.9	7.5
France (1972)	28.8	6.7
Switzerland (1976)	12.4	3.9
Italy (1974)	50.7	11.3
Israel (1975)	43.7	7.2
Japan (1976)	3.7	0.8
Australia (1975)	40.9	10.4

[1] In 1976, there were 45.1 births per 1,000 white women under 20 years of age, and 111.8 births per 1,000 black women under 20 years of age. These births comprised 15.5 percent of all white births, and 31.2 of all black births.

NOTE: Data presented are for 1976 or the latest available year.

SOURCES: United Nations: *Demographic Yearbook 1977*. Pub. No. ST/ESA/STAT/SER.R/6. New York. United Nations, 1978; National Center for Health Statistics: *Vital Statistics of the United States, 1976*, Vol. I. Public Health Service, DHHS, Hyattsville, Md. To be published.

Table B. Births and percent of infants weighing 2,500 grams or less, according to race and age: United States, 1978

Age	White		Black	
	Births	Percent 2,500 grams or less	Births	Percent 2,500 grams or less
15-29 years	2,155,041	6.0	469,345	12.9
Less than 15 years	4,512	10.9	6,068	16.9
15-19 years	380,060	8.1	151,001	14.6
15 years	15,756	9.8	12,525	15.1
16 years	40,776	9.1	22,754	15.0
17 years	74,425	8.5	32,038	14.7
18 years	108,074	8.0	39,933	14.5
19 years	141,029	7.4	43,751	14.2
20-24 years	914,772	5.9	196,731	12.7
25-29 years	860,209	5.2	121,613	11.4

SOURCE: Division of Vital Statistics, National Center for Health Statistics: Selected data.

of pregnancy complications for older teenagers having a first birth is somewhat higher than that for mothers in their twenties, adverse outcomes increase considerably for teenagers having higher order births (Menken, 1972).

Social Consequences

Currently, the proportion of out-of-wedlock births to teenagers is extremely high and has been increasing steadily through the 1970's. In 1978, more than 90 percent of births to black teenagers 15-17 years of age were out-of-wedlock, compared with 72 percent in 1969. For white teenagers of the same age, 40 percent were out-of-wedlock in 1978, compared with 24 percent in 1969 (table 4).

Many of these young mothers are apparently aware of the instability inherent in teenage marriages and often choose to rely on other support systems. Parents are often an important source of both economic and emotional support, as are friends. Many teenage mothers also depend, at least in part, on public assistance (Presser, 1980). Moreover, changing social values and abatement of the stigma attached to out-of-wedlock births undoubtedly have contributed to the downturn in marriage for pregnant teenagers.

An immediate effect of pregnancy for many teenagers is the interruption of their education. This applies particularly to younger teenagers who have not yet completed high school. Title IX of the Education Amendments of 1972 prohibits the exclusion of pregnant teenagers from schools that receive public funds. Nevertheless, the lack of supportive programs, economic need, and the responsibilities of child care may present seemingly insurmountable barriers to these young women. In general, the younger the teenager is at the onset of pregnancy, the fewer years of school she will complete when compared to peers who do not become pregnant (Moore et al., 1977).

Employment is more difficult for teenage mothers than for older mothers because of their lower levels of educational attainment and lack of work experience. In addition, finding and affording adequate child care can be a serious obstacle to a young woman with limited resources. For those young mothers who are employed, their relative lack of education is directly related to lower occupational status and earnings (Moore et al., 1977).

Teenage mothers are more likely to become dependent on public assistance for at least some period of time than are older mothers. This arises from the greater prevalence of out-of-wedlock births, marital disruption, and low educational attainment, all of which are predictive of welfare dependency (Moore et al., 1977).

Further exacerbating the difficulties of teenage mothers, an early age at first birth tends to lead to higher subsequent fertility. One study found that teenage mothers had 36 percent more children in the 15 years following their first birth than women who began childbearing at a later age (Trussell and Menken, 1978). In addition to fewer role options stemming from reduced educational and occupational opportunities, these young mothers have a particularly long childbearing period before them. Moreover, it has been suggested that their apparent ability to control the number and timing of births is considerably less than for women who delay childbearing until later ages (Trussell and Menken, 1978).

Conclusion

In view of numerous health risks and reduced life chances, teenage pregnancy is obviously a problem, not only to the mother and her infant, but to society as a whole. The provision of services to adolescents is a high priority of several programs of the Health Services Administration, such as the Family Planning, Maternal and Child Health, Community Health Center, and Migrant Health Center programs.

In 1978, Congress passed legislation creating the Office of Adolescent Pregnancy Programs to administer the adolescent pregnancy prevention and care program. This program is designed to provide federal funds for the establishment or expansion of community-based services for teenagers at risk of unintended pregnancy, as well as those who are currently pregnant or have a child.

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Trends in Mortality[a]

Overview

In 1978, there were 882 deaths per 100,000 population.[1] This represented a slight increase over the 1977 rate and it resulted from the aging of the population. Life expectancy at birth in the United States reached a record 73.3 years in 1978, an increase of 0.1 years since 1977. During the first half of the century, gains in life expectancy were dramatic, attributable to decreases in infectious and parasitic diseases. From 1950 to 1970, 2.7 years were added to the expectation of life. This pace of improvement accelerated during the 1970's, with 2.4 years being added since the beginning of the decade. Major gains in life expectancy were noted, especially for people of all races other than white whose life expectancy at birth improved by 6.5 years for women and 2.2 years for men from 1950 to 1970, compared with 3.4 years for white women and 1.5 years for white men. Since 1970, an additional 4.3 years were added for women and 4.0 years for men of all other races, compared with 2.1 years for white women and 2.2 years for white men. However, a sizable difference—about 5 years—still exists in life expectancy at birth between white people and all others.

Trends in mortality rates differ among age groups (table A; table 8; and figure 1). Age-specific death rates for children under 15 years of age have generally been declining since 1950. Among young people 15-24 years of age, death rates decreased nearly 2 percent per year from 1950 to 1960, but then they increased at about the same rate during the next 10 years. In the 1970's, the trend has been somewhat erratic with a slight increase in recent years.

Mortality rates for people 25-64 years of age decreased by less than 1 percent per year from 1950 to 1970, but the pace accelerated to a 2-3 percent per year decline during the 1970's.

Similarly, changes in mortality for the elderly were small from 1950 to 1970, but the rate of decline increased to an average of about 2 percent annually from 1970 to 1977. The 1977-78 estimated decreases are smaller, especially for people 75 years of age and over.

A large part of the change in the crude death rate from one calendar year to the next results from the changing age structure of the population. For an analysis of trends over time, it is advantageous to look at the age-adjusted death rate, a summary statistic useful for making annual comparisons. This rate shows what the level of mortality would be if no

Table A. Death rates, according to age: United States, 1977 and 1978

Age	*1977*	*1978*[1]	*Percent change 1977-78*
	Deaths per 100,000 population		
All ages, age-adjusted[2]	612.3	605.5	-1.1
All ages,[3] crude	878.1	882.3	0.5
Under 1 year	1,485.6	1,417.0	-4.6
1-4 years	68.8	66.9	-2.8
5-14 years	34.6	34.7	0.3
15-24 years	117.1	120.3	2.7
25-34 years	136.2	136.8	0.4
35-44 years	247.5	239.2	-3.4
45-54 years	620.7	610.3	-1.7
55-64 years	1,434.9	1,414.2	-1.4
65-74 years	3,055.6	3,018.1	-1.2
75-84 years	7,181.9	7,161.0	-0.3
85 years and over	14,725.9	14,679.1	-0.3

[1] Estimates.

[2] Age adjusted by the direct method to the total population of the United States as enumerated in 1940, using 11 age groups.

[3] Figures for age not stated included in "all ages," but not distributed among age groups.

NOTE: For 1978, rates are based on a 10-percent sample of deaths; for 1977, they are based on final data.

SOURCE: (National Center for Health Statistics, 1979).

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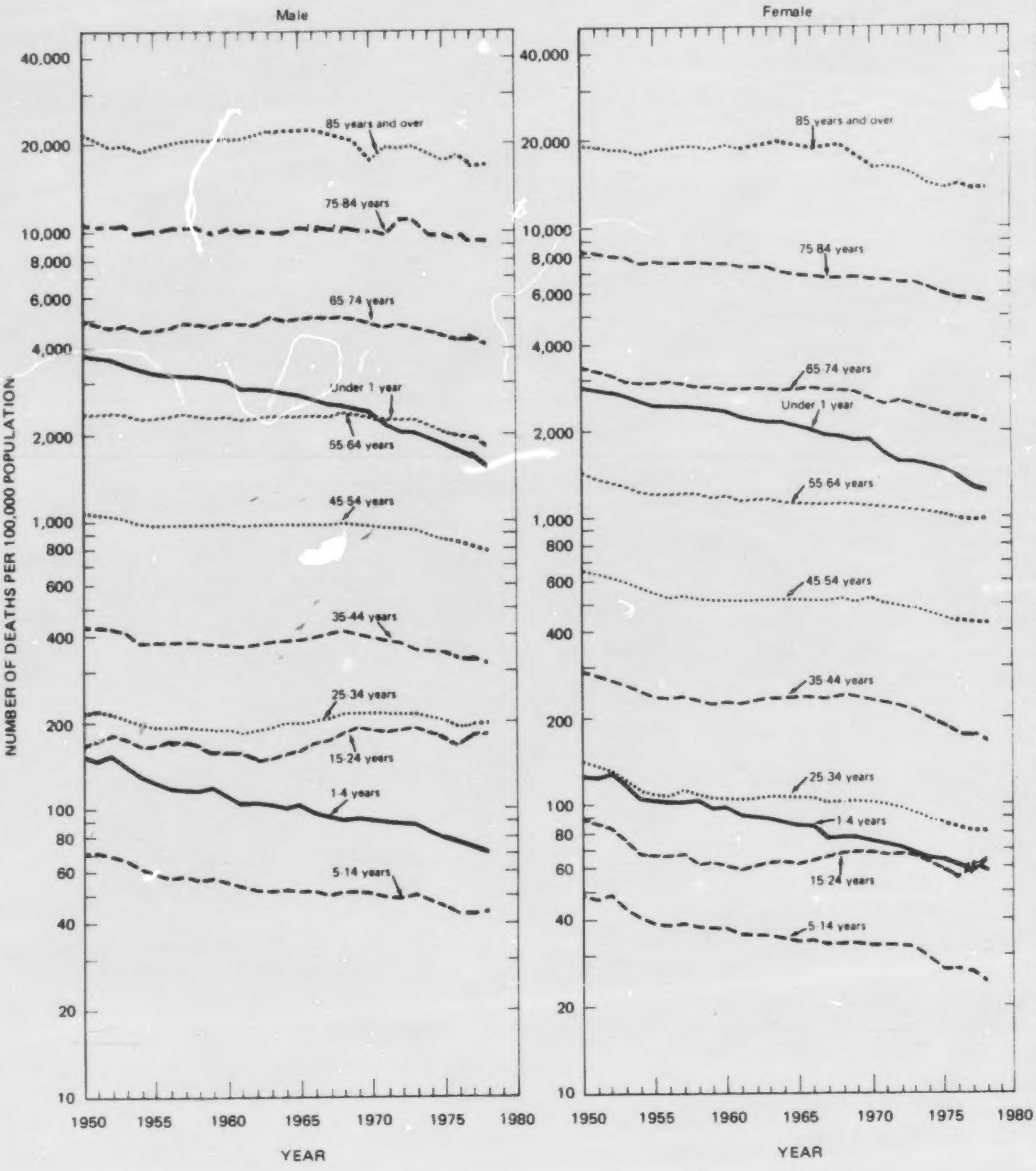
[1] Final data for 1978 were not available at the time this section was written. Wherever possible, provisional data for 1978 were used (NCHS, 1979). For detailed comparisons (e.g., by age, race, and sex), 1977 data were used.



NOTE: For 1978, rates are based on a 10-percent sample of deaths; for all other years, they are based on final data.

SOURCE: (National Center for Health Statistics, 1979).

Figure 1. Death rates, according to sex and age: United States, 1950-78

changes occurred in the age composition of the population from year to year. For the first half of this century, the age-adjusted death rate decreased by 53 percent from 17.8 deaths per 1,000 population in 1900 to 8.4 deaths in 1950. By 1978, it decreased another 27 percent to 6.1 deaths. If the decrease in mortality from 1950 to 1978 was measured only by the crude rate, however, it would be about 8 percent, a figure that does not reflect the magnitude of the true decline in death rates.

From 1950 to 1970, the age-adjusted mortality decreases were much greater for women than men in both the white and all other populations. During those 20 years, mortality rates for white women decreased 22 percent (1.2 percent per year), while the rates for white men decreased by only 7 percent (less than one-half percent per year). Among women and men of all other races, the difference was even greater—30 percent (1.7 percent per year) versus 9 percent (0.5 percent per year). Much of these differences resulted from heart disease mortality and mortality from cancer of the digestive system and peritoneum and the genital organs, for which the decreases have been greater for women than for men. More recently, decreases in mortality levels have accelerated for men and women. From 1970 to 1978, white mortality rates decreased at an average annual rate of 1.9 percent per year for women and 1.8 percent per year for men. Mortality for all other women decreased at 3.1 percent per year; for all other men, mortality decreased at 2.4 percent per year.

The relative difference between the age-adjusted mortality rate for men and women has been increasing over time. In 1950, the death rate for males was 1.5 times the female rate; by 1978, the ratio increased to 1.8. This increase in the sex ratio in mortality is evident for both white and black people. Among white people, the ratio increased from 1.5 in 1950 to 1.8 in 1978; for all other people, it increased from 1.2 to 1.7 during the same 28 years.

Cause of Death

Heart disease, cancer, stroke, and accidents have been the leading causes of death since 1950. In 1900, infectious diseases—particularly pneumonia and tuberculosis—were the leading causes of death, accounting for one-fifth of all deaths in the United States. The rapid decline in the death rates for these causes has been evident throughout the developed world. Social improvements in sanitation, nutrition, housing, and education contributed to the decline. Likewise, advances in medical care, such as immunization and the use of antibiotics, are associated with declining mortality.

Cardiovascular Diseases

More recently, however, decreases in death rates from some of the major chronic diseases—mainly the cardiovascular diseases, including heart and cerebrovascular diseases—have been evident.

Heart disease continues to be the leading cause of death in the United States and, as such, is the predominant influence on total mortality. The age-adjusted death rate decreased by 18 percent in the 20 years from 1950 to 1970, an average of 1 percent per year. It declined by nearly the same amount in the first 8 years of this decade at an average pace of 2.5 percent per year (table B; and table 15). During the past 10 years, heart disease mortality rates declined more rapidly in the younger age groups. The decline was more than 30 percent for each age group within the 25-44 years of age range, but about 20 percent for each succeeding age group.

Decreases in age-adjusted heart disease mortality have been much greater for women than for men, especially during the period 1950 to 1970 (table 15). For white women, heart disease mortality dropped 25 percent, compared with 9 percent for white men. For black women and men, the decreases were 28 percent and 10 percent, respectively. Through 1977, the rates of decline in heart disease mortality for both races and sexes became more nearly equal—18 and 19 percent for white and black women and 15 and 14 percent for white and black men. As a result, the relative differences in the death rates for heart disease between men and women have been increasing over time. In 1950, heart disease mortality for white men was 1.7 times that for white women. By 1977, the ratio widened to 2.1. Similarly, the sex ratio for the black population increased from 1.2 in 1950 to 1.6 in 1977.

Racial differences in heart disease mortality, especially for men at the younger ages, were large (table 15). For each 5-year age group 25-39 years of age, heart disease mortality for black men was more than twice as high as for white men in 1977. For each 5-year age group 40-64 years of age, the relative difference decreased. For people 65 years of age and over, mortality was lower for black men than for white men. Racial differences in heart disease mortality were greater for women than for men, especially at the younger ages.

Since ischemic heart disease mortality includes about 90 percent of all heart disease mortality, the trends were similar. The age-adjusted death rate declined by 25 percent during the 10-year period 1968-78. For each 10-year age group 25-74 years of age, declines of at least 25 percent were noted.

Some suggested explanations for the decline in heart disease mortality include:

- Decreased smoking.
- Improved management of hypertension.
- Decreased dietary intake of saturated fats.
- More widespread physical activity.
- Improved medical emergency services.
- More widespread use and increased efficacy of coronary care units.

Unfortunately, no definitive evidence exists to determine which of these factors or combination of factors actually accounts for the decline (Kleinman, Feldman, and Monk, 1979; Stern, 1979).

Table B. Age-adjusted death rates for selected causes of death: United States, 1968, 1977, and 1978

Cause of death	1968	1977	1978[1]	Average annual percent change 1968-77	1977-78
	Deaths per 100,000 population				
All causes	743.8	612.3	605.5	-2.1	-1.1
Diseases of heart	268.5	210.4	207.3	-2.7	-1.5
Ischemic heart disease	241.6	185.0	180.8	-2.9	-2.3
Malignant neoplasms	129.2	133.0	133.2	0.3	0.2
Malignant neoplasms of respiratory system	26.7	34.3	35.0	2.8	2.0
Cerebrovascular diseases	71.3	48.2	44.4	-4.3	-7.9
Accidents	55.0	43.8	45.3	-2.5	3.4
Motor vehicle accidents	28.4	22.4	24.0	-2.6	7.1
All other accidents	26.7	21.4	21.3	-2.4	-0.5
Influenza and pneumonia	26.9	14.2	15.4	-6.9	8.5
Diabetes mellitus	14.6	10.4	10.1	-3.7	-2.9
Cirrhosis of liver	13.9	13.1	12.4	-0.7	-5.3
Arteriosclerosis	9.6	6.2	6.1	-4.7	-1.6
Suicide	10.9	12.9	12.2	1.9	-5.4
Bronchitis, emphysema, and asthma	12.8	7.2	6.8	-6.2	-5.6
Homicide	8.3	9.6	9.9	1.6	3.1
Nephritis and nephrosis	3.9	2.7	2.5	-4.0	-7.4
Septicemia	1.2	2.4	2.6	8.0	8.3
All other causes	89.8	80.8	80.8	1.2	0.0

[1] Estimates.

NOTE: For 1978, rates are based on a 10-percent sample of deaths; for 1968 and 1977, they are based on final data. Rates are age-adjusted by the direct method to the total population of the United States as enumerated in 1940, using 11 age groups.

SOURCE: (National Center for Health Statistics, 1979).

The second major component of cardiovascular diseases is cerebrovascular disease or stroke, which was the third leading cause of death in the United States in 1977. From 1950 to 1970, cerebrovascular age-adjusted mortality rates decreased about 25 percent to 66 deaths per 100,000 population (table 14). By 1978, the estimated rate had decreased an additional 33 percent to 44 per 100,000 population (table B). Reductions were observed for men and women, white people and all other races. For every 10-year age group 25-74 years of age, a more than 40-percent decrease occurred in stroke mortality between 1968 and 1978. Even the two oldest age groups showed reductions of 32 and 38 percent, respectively. In recent years, age-adjusted cerebrovascular death rates have continued to decrease at a greater pace than have heart disease death rates—38 percent versus 23 percent since 1968. Possible factors related to the decline include lowered incidence, improved management and rehabilitation of the stroke victim, and effective hypertension therapy (i.e., as hypertension is a major risk factor for stroke).

Cancer

Malignant neoplasms, or cancer, is the second leading cause of death in the United States. In 1978, the age-adjusted mortality rate was 133 deaths per 100,000 population—6 percent higher than in 1950 (table B; and table 14). This overall rise masks significant differences in cancer mortality not only for individual sites, but also for men and women, white and black people, and the elderly and the young. For example, from 1950 to 1970, the age-adjusted cancer mortality rate increased at an average annual rate of 0.8 percent for white men and 2.3 percent for black men, and decreased at an average annual rate of 0.5 percent for white women and 0.3 percent for black women. From 1970 to 1977, the situation changed somewhat for women, showing annual increases of 0.1 percent and 0.7 percent for white and black women, respectively. There was also a slight decrease in the rate of increase for men, with increases of 0.5 percent and 1.6 percent for white and black men, respectively.

Cancer mortality has been increasing for some sites—the respiratory system, breast, colon, pancreas, and bladder—and has been decreasing for others—the stomach, rectum, cervix, and uterus.

From 1968 to 1978, decreases of more than 30 percent occurred in cancer mortality for the population under 15 years of age. Decreases were about 20 percent for the population 15-44 years of age. The decreases came about, in part, through reduced incidence of breast cancer in younger women, lung cancer in younger men, and substantial improvements in treatment for childhood leukemia and Hodgkins disease. For the 10-year age groups 55-84 years of age, cancer mortality increased, ranging from 6 to 15 percent since 1968.

Respiratory cancer included about one-quarter of all deaths from malignant neoplasms in 1978. Age-adjusted respiratory cancer mortality increased by 31 percent between 1968 and 1978 to 35 deaths per 100,000 population, while the rates for all other cancers combined actually declined by 4 percent (table B).

The age-adjusted mortality rate for respiratory cancer more than doubled from 1950 to 1970, increasing at average annual rates of 4 percent each for white men and women and at 7 percent and 5 percent, respectively, for black men and women. During the following 7 years, mortality increased an additional 3 percent per year. The annual rates of increase slowed substantially for men and increased for women (table 18).

From 1950 to 1970, the sex ratios (i.e., male mortality to female mortality) in age-adjusted respiratory cancer mortality increased for black people; but by 1977, the ratios had decreased as a result of a faster rate of increase in female mortality. Regardless, respiratory cancer mortality for men was significantly higher than for women (56 deaths versus 16 deaths per 100,000 population in 1977 for white people and 78 deaths versus 17 deaths for black people).

The recent slower rates of increase for male mortality are attributed, in part, to lowered smoking rates and to the growing acceptance of cigarettes with lower tar and nicotine levels. Increases in heavy smoking for females may account for some of the reduction in the sex differences. In fact, the increase in smoking among women may result in female lung cancer deaths outnumbering breast cancer deaths (the current leading cancer site for women) by the mid-1980's (American Cancer Society, 1978).

Accidents and Violence

Accidents remain the fourth leading cause of death in the United States. They are the leading cause of death for the population 1-34 years of age. The major component within this category is motor vehicle accidents at 50 percent of the total.

Motor vehicle accident mortality for the total population decreased about 1 percent per year between 1968 and 1973. The rate dropped 17 percent from 1973 to 1974, and remained at this low level for 2 additional years. These years with lowered rates were during the initial establishment of the 55 miles per hour speed limit throughout the country. However, the death rate increased by 4 percent from 1976 to 1977, and by an estimated 7 percent between 1977 and 1978—perhaps indicating relaxed adherence to or enforcement of the speed limit. In 1978, there were 53,610 motor vehicle related deaths in the United States, more than in any year since 1973.

After a steady increase from the early 1960's to 1974, the age-adjusted death rate for homicide declined slightly. This decline resulted from a reduction in homicide for the all other population where the rate decreased by 6 percent per year between 1973 and 1977. The rate for the white population during this period, which was about one-eighth that of the all other rate for men and one-quarter that for women, fluctuated in a haphazard manner.

The age-adjusted suicide rate has generally been increasing during the past decade for all color and sex groups. However, the provisional 1978 rate is 5 percent below the 1977 rate. The suicide rate for white people is about twice the rate for all others.

Race Differentials

One of the largest and most persistent differences in mortality is that between white and black Americans. To explain these differences, specific age and sex groups must be addressed. While United States death rates for black people are almost always higher than comparable rates for white people, the discrepancies vary a great deal depending on the specific population group. For instance, in 1977, black girls 10-14 years of age experienced a death rate about 13 percent higher than the rate for the comparable white group. Black women in their fifties experienced death rates approximately double those for comparable white women, but black women in their eighties experienced lower rates than white women of the same ages.

The greatest differentials were found among men. Ratios of 2-1/2 to 1 and higher were seen in the rates reported for black men 25-39 years of age when compared to white men of comparable ages. Since there was a severe undercount of black men in these age groups in the 1970 decennial census, these reported ratios are somewhat exaggerated. Nevertheless, the true rates for black men are certainly a great deal higher than those for white men. The major cause of these discrepancies during the young adult years is the homicide rates. For instance, black men 25-29 years of age had a homicide rate more than eight times that of white men in 1977. This accounts for about half of the excess black deaths among men in that age group. The ratio of black to white death rates for cirrhosis of the liver was approximately 5 to 1, but this cause was too rare to account for a major portion of the differential in the total rate. A wide variety of causes, ranging from heart disease to cancer, made up the remainder of the difference between white and black rates for this age group.

For the 15-19 years of age group in 1977, white men had nearly the same death rate as black men. White teenagers, because of their higher socioeconomic status, have greater access to automobiles than do black teenagers. In 1977, the death rate from motor vehicle accidents for white men 15-19 years of age was twice as high as the rate for black men in the same age group. On the other hand, the black homicide rate was several times that of the white rate. The two differences balanced each other out.

For middle-aged men, the toll of circulatory diseases begins to outweigh accidental deaths. Although homicide still accounted for 25 percent of the difference between white and black rates for men 35-39 years of age, the circulatory diseases were a close second with 20 percent. Hypertension was a major contributory factor to mortality from circulatory diseases, and black people have about twice the rate of hypertension as do white people. The reasons for this difference are unknown.

Obviously, lifestyle differences contribute markedly to the differentials between black and white mortality. Various forms of violence contribute to the rate for young adult males. For older age groups, chronic diseases account for a vast majority of the deaths. Even there, lifestyle differences are important; a larger proportion of black people smoke than white people, and obesity is far more prevalent among black middle-aged women than their white counterparts (Office of Health Resources Opportunity, 1979). Furthermore, black people may be exposed to more occupational hazards than white people are.

However, differences in access to high quality medical care also probably account for some of the mortality differential. Black people receive considerably fewer preventive services, on the average, than do white people (Office of Health Resources Opportunity, 1979). Treatment is delayed until later stages of disease more frequently among black people than among white people (Gonnella, Louis, and McCord, 1976). Black people with a diagnosis of cancer do not survive as long as white people, even if the stage at diagnosis is taken into account (Office of Health Resources Opportunity, 1979). Thus, increased access to medical care would probably improve the death rates for black people somewhat, particularly if coupled with a more healthy lifestyle.

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The Recent Decline in Infant Mortality[a]

The chances of being born alive and surviving the first year of life have been steadily improving. At the turn of this century, about 100 of every 1,000 infants born in the United States died before their first birthday. By 1950, the number was slashed to 29 of every 1,000 infants.

Progress in the latter half of this century has not been quite as dramatic. However, after a period of relative stability between 1950 and the mid 1960's, infant mortality rates have again begun to decline at a fast pace. Between 1965 and 1979, infant mortality declined by 47 percent to 13 deaths per 1,000 live births.[1]

Despite the sizable decline in infant mortality during the past decade, there remain large differences in rates among subgroups of the population and among geographic areas in the United States. Furthermore, several countries throughout the world have considerably lower infant mortality rates than those observed in the United States.

In this section, a discussion of recent trends in infant mortality and related rates for the white and black populations, geographic variation in these rates, and the role of birth weight in determining trends is presented.

Infant Mortality by Age at Death

In 1977, a black newborn was nearly twice as likely to die during infancy as a white newborn. Higher mortality among black infants has been observed ever since reliable statistics have been available. Furthermore, the gap is not narrowing (figure 1). Although both white and black mortality have been declining at the rate of 4.5 percent per year since 1965, this trend in overall infant mortality masks important differences in the trends for two of its components—neonatal mortality (deaths during the first month of life) and postneonatal mortality (deaths during the remainder of infancy). A greater disparity exists between black and white rates for postneonatal mortality than for neonatal mortality. However, the former differential is decreasing while the latter is increasing.

Postneonatal deaths are generally believed to be more closely related to environmental and socioeconomic factors than are neonatal deaths (Pharoah and Morris, 1979). Between 1935 and 1965—a period of rapid improvement in economic and environmental conditions—the decline in postneonatal mortality accounted for 53 percent of the reduction in infant mortality. However, the contribution of postneonatal mortality to the recent decline in infant mortality diminished, accounting for only 26 percent of the decline in infant mortality between 1965 and 1977.

For black infants, postneonatal mortality declined by 50 percent since 1965, compared with 33 percent for white infants. Thus, the gap between black and white postneonatal mortality rates decreased from a ratio of 2.81 in 1965 to 2.11 in 1977. For neonatal mortality during the same period, however, there was a 46-percent decrease for white infants and a 39-percent decrease for black infants, thereby increasing the black to white mortality ratio from 1.65 to 1.85. Reduced neonatal mortality accounted for 80 percent of the decline in white infant mortality, compared with only 57 percent of the decline in black infant mortality.

The chances of being born alive have also been increasing rapidly since the mid-1960's, more so for other races than for the white population. Between 1965 and 1977, the white fetal death rate declined by 37 percent, compared with 45 percent for all other races. Data for the black population only were not available. Once again, however, other than white infants were at considerably greater risk in 1977 with a rate of 14.6 fetal deaths per 1,000 live births and fetal deaths than were white infants with a rate of 8.7.

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[a] Prepared by Joel C. Kleinman, Ph.D., National Center for Health Statistics, and Samuel S. Kessel, M.D., Office of the Assistant Secretary for Health.

[1] Only provisional data are available for 1978 and 1979. The remainder of this section will use final detailed data that are available through 1977.

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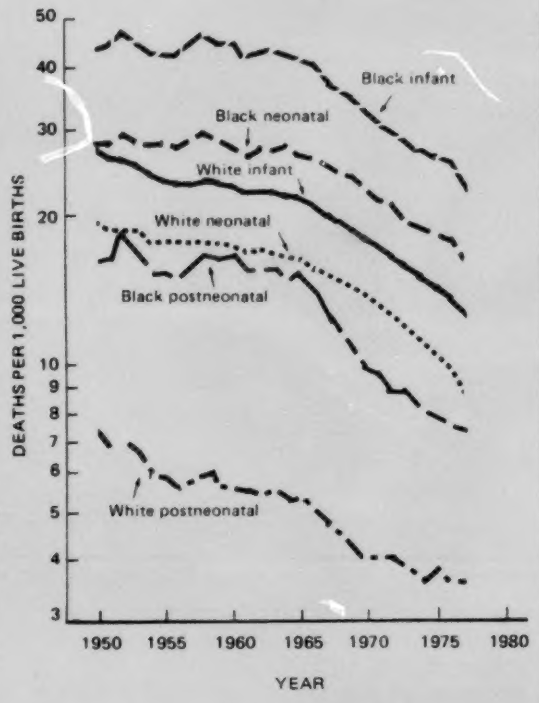

SOURCE: National Center for Health Statistics: Computed by the Division of Analysis from data compiled by the Division of Vital Statistics.

Figure 1. Infant, neonatal, and postneonatal mortality rates, according to race: United States, 1950-77

Variation by State

Although the decline in infant mortality has been observed in all States, there are variations in its magnitude. Maine and Utah had the lowest white infant mortality rates for 1975-77 at 11.3 deaths per 1,000 live births (table 11). Utah also had one of the lowest rates for 1965-67, although Maine's rate at that time was higher than the United States rate for white infants. Maine's white infant mortality rate declined by 50 percent from 1965-67 to 1975-77, compared with a national reduction of 35 percent during the same 10-year period. Vermont and New Hampshire also had large declines of 45 percent, which made them two of the 10 States with the lowest rates for 1975-77. Delaware and Hawaii were two of the five States with the lowest rates for both time periods.

West Virginia had the highest white infant mortality rate for both time periods, although it exhibited the same decline during the 10-year interval as that observed nationally. Wyoming, Montana, New Mexico, and Oklahoma had the next highest infant mortality rates for 1975-77, and all but Oklahoma were among the 10 States with the highest rates for 1965-67. Colorado showed a 45-percent decline during the 10-year period and this improved its standing from the 6th highest rate for 1965-67 to the 15th lowest rate for 1975-77. No appreciable narrowing of the variation among States occurred during the 10 years. The ratio of the white infant mortality rate for the highest State to the rate for the lowest State was 1.47 for 1965-67 and 1.43 for 1975-77.

As was the case for white infants, mortality among black infants declined in every State. Based on only the 29 States with more than 5,000 black births for both 1965-67 and 1975-77, Massachusetts, California, Delaware, Wisconsin, and Kentucky had the lowest rates for 1975-77. Of these, only California and Wisconsin also had low rates for 1965-67. The other three States experienced declines of 46-50 percent during the 10-year period, compared with the national reduction of 37 percent. For 1965-67, the rates for Delaware and Kentucky were higher than the national black infant mortality rate.

Illinois, the District of Columbia, Mississippi, Connecticut, and South Carolina had the highest black infant mortality rates for 1975-77. Yet two of these—the District of Columbia and Connecticut—had among the lowest five rates for 1965-67. The District of Columbia rate declined by only 12 percent over the 10 years; Connecticut's rate declined by 22 percent. The remaining three States with high rates—Illinois, Mississippi, and South Carolina—were also among the five States with the highest rates for 1965-67. Mississippi's rate was extremely high for 1965-67; in fact, it was 14 percent greater than the next highest rate in North Carolina. During the 10-year interval, this rate decreased by 46 percent indicating significant improvement, although Mississippi was still one of the five States with the highest rates for 1975-77.

If the extremely high rate in Mississippi for 1965-67 is excluded, a slight increase occurred in the variation among States during the 10-year period. The ratio of the black infant mortality rate for the highest State to the rate for the lowest State was 1.41 for 1965-67 and 1.50 for 1975-77. The 1965-67 ratio jumps to 1.61 if Mississippi is included, however.

Variation by Level of Urbanization

Substantial variation in infant mortality also exists by level of urbanization (table A). For 1974-77, suburban counties of large metropolitan areas (more than 1 million population) had the lowest rates—12.3 deaths per 1,000 live births for white infants and 23.9 per 1,000 for black infants. In contrast, the highest infant mortality rates were observed in nonmetropolitan counties with small cities not adjacent to metropolitan areas—15.1 per 1,000 for white infants and 28.9 per 1,000 for black infants. These patterns have remained fairly stable since the 1960's, except black infant mortality in the central cities of

Table A. Infant mortality rates, according to level of urbanization and race: United States, 1974-77

Level of urbanization[1]	Total[2]	White	Black
	Number of deaths per 1,000 live births		
All counties	15.5	13.7	25.5
Within SMSA	15.2	13.3	24.9
Large SMSA	15.4	13.0	25.1
Core counties	16.4	13.4	25.3
Fringe counties	13.1	12.3	23.9
Medium SMSA	14.9	13.3	24.4
Other SMSA	15.4	13.9	25.1
Outside SMSA	16.2	14.5	27.6
Adjacent to SMSA	15.8	14.2	27.4
Urbanized	14.9	13.8	26.9
Less urbanized	16.5	14.5	28.0
Thinly populated	16.8	15.1	25.8
Not adjacent to SMSA	16.6	14.9	27.9
Urbanized	16.5	14.8	26.8
Less urbanized	16.9	15.1	28.9
Thinly populated	16.0	14.4	27.2

[1] See glossary for definitions of categories.
[2] Includes all other races not shown separately.

SOURCE: National Center for Health Statistics: Computed by the Division of Analysis from data compiled by the Division of Vital Statistics.

large metropolitan areas has not declined as rapidly as in the remaining areas of the country.

When the rates are examined by geographic division, the disparity increases. White infants in Middle Atlantic suburban counties had a mortality rate of 11.9, compared with 18.0 for those in rural countries adjacent to metropolitan areas in the West South Central States. For black infant mortality, the variation was greater—16.0 in Pacific suburban counties, compared with 32.4 in nonmetropolitan counties with small urban populations not adjacent to metropolitan areas in the East South Central States. This low rate for black infants in Pacific suburban counties is especially noteworthy since it was only 35 percent higher than the rate for white infants in those counties, compared with a national differential of 86 percent.

The Role of Birth Weight

Survival is not the sole criterion for assessing pregnancy outcomes. Many conditions that may lead to an infant's death also carry potential hazardous consequences when the outcome is not fatal. The most significant characteristic associated with a poor pregnancy outcome is low birth weight, usually defined as less than 5 1/2 pounds (2,500 grams). Low birth weight is an important predictor of untoward events that may befall the infant in the immediate postpartum period and compromise future health. For example, low-birth-weight infants face a 40-fold greater chance of dying before 1 month of age and are 5 times more likely to die between 1 month and 1 year of age when compared to infants of normal birth weight. They are also more likely to have serious congenital anomalies or other severe impairment (Shapiro et al., 1980).

In 1977, 235,000 low-birth-weight infants were born in the United States; this represented 7.1 percent of all live births. The incidence of low birth weight was more than twice as high for black infants as it was for white infants—12.8 percent and 5.9 percent, respectively. Nearly all the difference in neonatal mortality between white and black infants can be attributed to the differences in birth weight distribution. Furthermore, the higher infant mortality in the United States when compared to the Scandinavian countries, for example, is attributable to the higher incidence of low birth weight in the United States. When looking at weight-specific mortality rather than overall infant mortality, Sweden's rates for each weight group were consistently higher than those observed in six selected States in 1973 (World Health Organization, 1978).

Hemminki and Starfield (1978) recently reviewed several studies related to the prevention of low birth weight. Among the factors cited as possibly contributing to low birth weight were: poor nutrition, smoking, stress, poor physical condition, and several specific diseases that are not pregnancy-related. They also reviewed 37 controlled studies that attempted to evaluate the effectiveness of certain interventions to prevent low birth weight. Of these, only three showed that intervention was beneficial. The authors recommended that additional studies be undertaken, especially those involving the effect of such factors as physical exercise before pregnancy, physical and psychological stress during pregnancy, and diet. The role of cigarette smoking among pregnant women in increasing the risk of low birth weight is also receiving a great deal of attention (Office of the Assistant Secretary for Health, 1980).

The incidence of low birth weight declined by 14 percent between 1965 and 1977, while infant mortality declined by 43 percent. The reason for this disparity is that significant reductions have occurred in birth-weight-specific mortality rates. In particular, one of the major factors contributing to the recent decline in infant mortality, and especially neonatal mortality, is the greatly improved survival for infants of low birth weight. Before the mid-1960's, little change in neonatal mortality among infants of low birth weight was apparent. Yet comparison of weight-specific mortality rates in selected States (national rates are unavailable after 1960) suggests that large reductions in neonatal mortality for low-birth-weight infants have occurred during the late 1960's and 1970's (Kleinman et al., 1978; Zdeb, 1978).

Much of this improved outcome for low-birth-weight infants has been attributed to advances in neonatology and the establishment of regionalized perinatal networks (Hack et al., 1979; Committee on Perinatal Health, 1977). While the effectiveness of some recent technological developments in perinatal medicine remains controversial (National Institutes of Health, 1979), it is likely that a large part of the recent reduction in neonatal mortality has resulted from progress in the management of pregnant women at high risk and advances in newborn intensive care.

The lack of national data on weight-specific mortality after 1960 makes it difficult to document the contribution of reduced mortality among low-birth-weight infants to the overall reduction. However, certain indirect calculations are possible (Kleinman et al., 1978; Lee et al., 1980). By applying the 1960 weight-specific neonatal mortality rates (National Center for Health Statistics, 1972) to the birth weight distribution of live births in 1977, it was found that white neonatal mortality would have decreased by 9 percent between 1960 and 1977 if there had been no change in weight-specific mortality rates. Since neonatal mortality actually declined by 49 percent during this period, it can be inferred that 18 percent of the overall reduction in white neonatal mortality resulted from a more favorable birth weight distribution and 82 percent resulted from a reduction in weight-specific mortality rates. For other than white infants (data for black infants only are unavailable for 1960), the 1977 birth weight distribution was similar to the 1960 distribution; no change in mortality was expected based on 1960 weight-specific rates. Thus, all of the observed 45-percent reduction in neonatal mortality for other than white infants resulted from a reduction in weight-specific mortality.

By making one more assumption about the size of the reduction in weight-specific mortality, the effect of improved survival among low-birth-weight infants can be estimated. Two studies covering seven States reported nearly constant proportional reductions in weight-specific mortality for infants weighing more than 1,000 grams, but little or no reduction for infants weighing 1,000 grams or less (Kleinman et al., 1978; Zdeb, 1978). Assuming that nationally there has been no change in neonatal mortality among infants weighing 1,000 grams or less and constant proportional reductions among other infants, then the reduction in the white neonatal mortality rate between 1960 and 1977 can be partitioned as follows: 18 percent resulted from a more favorable birth weight distribution, 48 percent was attributable to a reduction in mortality among infants weighing between 1,000 and 2,500 grams, and 34 percent resulted from a reduction in mortality among infants weighing more than 2,500 grams. Under the same assumption, neonatal mortality among other than white infants can be divided as follows: 61 percent resulted from a reduction in mortality among infants weighing between 1,000 and 2,500 grams; and 39 percent was attributable to a reduction in mortality among infants weighing more than 2,500 grams (as noted earlier, virtually no change occurred in birth weight distribution). More recent reports from individual hospitals, however, suggest that improved survival is now evident even among infants weighing 500 to 1,000 grams (Hack et al., 1979).

National data on fetal mortality also show substantial improvement in each birth weight group of more than 1,000 grams (table B). Although there have been greater reductions in fetal mortality rates among infants of higher birth weight, the reductions for birth weights between 1,000 and 2,500 grams ranged from 27 to 46 percent.

Table B. Fetal death rates, according to color and birth weight: United States, 1965 and 1977

Birth weight	White		All other	
	1965	*1977*	*1965*	*1977*
	Fetal deaths per 1,000 live births and fetal deaths			
All weights[1] ...	13.7	8.7	26.5	14.6
500 grams or less	574.9	533.8	532.0	502.4
501-1,000 grams	347.5	322.7	346.9	298.9
1,001-1,500 grams ..	206.5	151.3	204.3	132.1
1,501-2,000 grams ..	94.3	67.9	98.0	59.7
2,001-2,500 grams ..	29.2	20.0	32.2	17.3
2,501-3,000 grams ..	7.9	5.2	9.4	4.4
3,001-3,500 grams ..	3.7	2.2	5.6	2.5
3,501-4,000 grams ..	3.0	1.6	6.2	2.4
4,001-4,500 grams ..	4.1	2.1	11.2	5.3
4,501 grams or more	16.8	6.3	50.9	23.6

[1] Includes birth weight not stated.

NOTE: Fetal deaths for 1977 include only those with stated or presumed period of gestation of 20 weeks or more. For 1965, gestational age not stated is included.

SOURCE: National Center for Health Statistics: Computed by the Division of Analysis from data compiled by the Division of Vital Statistics.

Improved survival among low-birth-weight infants has led to some concern about the potential for a concomitant increase in serious morbidity among survivors. However, studies based on followup of infants discharged from individual hospitals indicate that serious disabilities have decreased rather than increased among surviving infants (Hack et al., 1979; Stewart, 1977). A large-scale evaluation of several regionalized perinatal centers is now being conducted by the Health Services Research Center at Johns Hopkins University in Baltimore, Md. Baseline results indicate that, although illness during the first year of life increased with decreasing birth weight, the incidence of severe impairment among survivors weighing less than 1,500 grams at birth was 14 percent (Shapiro et al., 1980).

Although improvement in survival among low-birth-weight infants has contributed a great deal to reduction in neonatal mortality, a decline in the incidence of low birth weight would result in still lower mortality and morbidity. A balanced approach to prevention of low birth weight and improvement in survival of low-birth-weight infants is clearly required to assure continued improvement in infant health.

Summary

After a decade of relative stability, infant mortality rates in the United States have declined rapidly since the mid-1960's. The infant mortality rate is about twice as high for black infants as it is for white infants, and both rates are decreasing at the same pace.

Substantial variation among States has been observed. For 1975-77, the ratio of the rate for the State with the highest infant mortality to the State with the lowest was 1.43 for white infants and 1.50 for black infants. Furthermore, although several States have shifted position, the extent of the variation has not changed since the mid-1960's. Variation by level of urbanization was not nearly as large. For both white and black infants, nonmetropolitan counties not adjacent to metropolitan areas had mortality rates about 20 percent greater than those of suburban counties of large metropolitan areas.

The reduction in mortality among low-birth-weight infants accounted for a substantial portion of the decline in overall neonatal mortality rates between 1960 and 1977. Among white infants, a small improvement in birth weight distribution has occurred but this has not been the case among black infants. Further progress in reducing the incidence of low birth weight would result in reduced infant mortality and morbidity.

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Hypertension[a]

Overview

Hypertension, commonly called high blood pressure, is one of the more prevalent chronic conditions in this country for which effective treatment is available. Estimates of the number of Americans with hypertension range from 23 million to as many as 60 million, depending on the criteria used for defining hypertension and the age groups included in the calculation. Several major epidemiological studies have shown that elevated blood pressure is one of the primary risk factors contributing to death from cardiovascular diseases (Kannel, Wolf, and Dawber, 1978). Estimates based on the Framingham Heart Study (Shurtleff, 1974) indicate that men 45-54 years of age with elevated blood pressure are twice as likely as those with normal pressure to experience a coronary event.[1]

As a result of these studies, clinical trials were initiated to determine whether individuals who controlled their hypertension through appropriate medical treatment reduced their risk of death. Several years ago, the control of severe hypertension was shown to reduce mortality. It was not until 1979, however, that a large clinical trial established that the control of mild hypertension also reduces mortality.

This section discusses these trials, trends in hypertension-related mortality and hypertension control, and some of the barriers to effective control of hypertension.

Effects of Hypertension Control

In the late 1960's and early 1970's, the Veterans Administration Cooperative Study Group (1967 and 1970) published data demonstrating that antihypertensive drugs were effective in reducing morbidity and mortality resulting from hypertension in middle-aged men with sustained high blood pressure. This randomized, double-blind, placebo-controlled trial recorded a significantly lower incidence of morbid events, such as stroke and congestive heart failure, in severe hypertensives with baseline diastolic pressures averaging 115 to 129 millimeters of mercury and in men with baseline diastolic pressures averaging 105 to 114 millimeters of mercury in contrast to the control group. In the treated subgroup with mild hypertension (i.e., diastolic blood pressures averaging 90 to 104 millimeters of mercury), the effects of medication could not be determined because of the small sample size.

The National Heart, Lung, and Blood Institute (NHLBI) published the results of its five-year Hypertension Detection and Followup Program (HDFP) of 10,940 hypertensive patients 30-69 years of age in the latter part of 1979 (HDFP Cooperative Group, 1979). This program was conducted in 14 American cities between 1973 and 1978, comparing outcomes for patients receiving intensive treatment in a highly organized clinic setting (i.e., stepped care) with patients referred to standard community medical services (i.e., referred care).

Control of hypertension was significantly better for the stepped care group than for the referred care group. By the end of the fifth year, 65 percent of those patients receiving the intensive treatment had achieved their desired goals for blood pressure; in contrast, only 44 percent of the referred care patients had reached their goals. Five-year mortality from all causes was 17 percent lower for the stepped care group when compared to the referred care group (6.4 deaths versus 7.7 deaths per 100 people). Furthermore, even among patients with mild hypertension (i.e., diastolic blood pressures of 90 to 104 millimeters of mercury), the stepped care group had significantly lower mortality than the referred care group (5.9 deaths versus 7.4 deaths per 100 people).

Some variation in the effects of treatment was noted, however. Essentially no difference was apparent in mortality between stepped care and referred care for all white women and all people 30-49 years of age. Furthermore, the design of the study precluded a direct examination of whether the reduction in mortality resulted from the antihypertensive drugs or the more structured systematic care given in the stepped care group (Stimmler, Plindett, and McMillen, 1980; Ramsay, 1980). Nevertheless, this study provides the best available evidence that even mildly elevated blood pressure can be reduced, and that such reduction often leads to reduced mortality.

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[a] Prepared by Kathleen M. Danchik and Joel C. Kleinman, Ph.D., National Center for Health Statistics.

[1] The comparison made is between systolic measurements of 170 millimeters of mercury (elevated blood pressure) and 130 millimeters of mercury (normal blood pressure).

Hypertension-Related Mortality

Death rates for ischemic heart disease and stroke (the major components of cardiovascular diseases) increase sharply with age. Furthermore, females generally have lower rates than males, although the differential varies by cause, race, and age. In 1977, white men were from two to three times more likely to die from cardiovascular diseases than were white women (table A). Among black people, death rates for cardiovascular diseases were from 40 percent to 90 percent higher for men. Ischemic heart disease death rates showed a much greater differential between men and women. The male-to-female ratios ranged from 2.33 to 5.39 for white people and from 1.52 to 2.42 for black people. The ratios decreased with age for both races. Male-to-female mortality ratios were considerably lower for stroke, ranging from 0.96 to 1.44 for white people and 1.22 to 1.34 for black people.

In part because they have higher blood pressure levels, black people experienced substantially higher cardiovascular mortality than white people for all age groups 35-74 years in 1977 (table A). The black-to-white ratio was particularly high for younger people, for women, and for stroke.

Although cardiovascular diseases were among the leading causes of death in 1977, substantial declines in these death rates since 1968 have occurred (table B). The reductions in mortality were evident for all age, race, and sex groups. However, black women experienced the greatest declines for all cardiovascular diseases and its two major components—ischemic heart disease and stroke. Black men experienced relatively large reductions in stroke mortality. The magnitude of these reductions can best be appreciated by noting that the percent decreases observed in the first 7 years of the 1970's were generally as great as those observed in the 20 years from 1950 to 1970.

Hypertension Control

Hypertension awareness, detection, and control have greatly increased in recent years, possibly contributing to the mortality decline. These increases

Table A. Death rates for selected causes of death according to age, race, and sex: United States, 1977

Cause of death and age	*Total*[1]	*White male*	*White female*	*Black male*	*Black female*
Major cardiovascular diseases			*Deaths per 100,000 population*		
35-74 years[2]	502.1	705.4	290.7	919.6	580.8
35-44 years	62.3	80.7	27.4	181.0	97.1
45-54 years	230.8	331.5	100.3	536.2	303.7
55-64 years	636.7	907.2	331.7	1,281.3	756.9
65-74 years	1,596.3	2,223.6	1,054.7	2,425.2	1,704.1
Ischemic heart disease					
35-74 years[2]	356.2	538.6	187.8	581.1	333.7
35-44 years	38.4	59.8	11.1	100.0	41.4
45-54 years	166.3	266.9	56.5	344.9	165.0
55-64 years	466.5	715.1	216.9	834.0	455.2
65-74 years	1,116.4	1,642.8	704.8	1,512.4	992.4
Cerebrovascular disease					
35-74 years[2]	73.3	76.6	55.9	175.4	138.7
35-44 years	10.3	7.8	8.1	34.8	26.0
45-54 years	28.7	24.7	21.7	89.4	71.4
55-64 years	79.5	80.3	58.2	223.9	167.3
65-74 years	259.9	290.8	201.6	515.8	423.9

[1] Includes all other races not shown separately.

[2] Age adjusted by the direct method to the 1970 resident population of the United States using 4 age groups.

SOURCE: Division of Vital Statistics, National Center for Health Statistics: Selected data.

Table B. Percent reduction in death rates for selected causes of death, according to age, race, and sex: United States, 1968-77

Cause of death and age	Total[1]	White male	White female	Black male	Black female
	Percent reduction[2]				
Major cardiovascular diseases					
35-74 years[2]	25.7	23.5	27.3	27.1	34.5
35-44 years	32.3	30.3	31.3	34.4	47.2
45-54 years	25.0	23.8	25.6	26.6	35.3
55-64 years	24.6	23.9	23.4	24.9	34.1
65-74 years	26.1	22.7	29.1	27.9	32.8
Ischemic heart disease					
35-74 years[2]	25.2	23.6	27.3	23.3	31.1
35-44 years	32.3	31.7	31.9	31.1	45.1
45-54 years	23.7	23.7	22.4	22.2	30.6
55-64 years	24.4	24.3	23.5	21.1	30.5
65-74 years	25.7	22.5	29.4	24.5	30.3
Cerebrovascular disease					
35-74 years[2]	36.0	30.9	34.1	40.5	44.5
35-44 years	37.6	35.0	31.9	40.0	52.8
45-54 years	35.7	35.2	32.6	40.4	45.1
55-64 years	34.7	34.6	28.9	40.8	45.4
65-74 years	36.5	28.2	36.4	40.4	42.6

[1] Includes all other races not shown separately.

[2] Percent reduction between age-adjusted death rates for 1968 and 1977.

SOURCE: Division of Vital Statistics, National Center for Health Statistics: Selected data.

can partly be attributed to the National High Blood Pressure Education Program in which government agencies, private industry, and voluntary health associations participated in the early 1970's. Through this program, the American public and the health professions were alerted to the dangers of hypertension and educated about the relatively simple methods of detection, the most effective medication and treatment regimens, and the importance of continuing care.

The only national data available to assess trends in control of hypertension are based on the National Health Examination Survey of 1960-62 and the National Health and Nutrition Examination Survey of 1971-74. These data are limited, however, in several ways (National Center for Health Statistics, 1977). First, the interview questions were not exactly the same between the two surveys, although it is possible to obtain nearly the same information. Also, the physicians taking the blood pressures differed. In addition, the comparison is based on results of a single blood pressure measurement—the first one if multiple measurements were available. Since blood pressure measurements are quite variable, it is possible that some of those with elevated blood pressure were not actually hypertensive. This would tend to diminish the chances of finding an increase in control of hypertension. Furthermore, since the latest available data are for 1971-74, the impact of the high blood pressure education program, which was only beginning in the early 1970's, is not fully reflected by changes in hypertension control between these two time periods.

Nevertheless, table C does show favorable changes in treatment, awareness, and control of hypertension for people 35-74 years of age, especially for black men. The prevalence of hypertension among white and black men increased between 1960-62 and 1971-74, a finding which is consistent with increasing survival among hypertensives. However, the prevalence among women increased only slightly.

The proportion of hypertensives who were unaware of their condition declined for each race and sex group, but it was most pronounced among black men. The proportion of hypertensives taking medication increased substantially in each group with the greatest increase again observed among black men. Finally, increases occurred in each group in the proportion of hypertensives whose blood pressure was under control (below a systolic measurement of 160 millimeters of mercury over a diastolic measurement of 95 millimeters of mercury). The differential in treatment and control of hypertension between black

Table C. Prevalence of hypertension among people 35-74 years of age and selected characteristics of hypertensives, according to race and sex: United States, 1960-62 and 1971-74

Race and sex	Hypertensive[1]		Unaware[2]		On medication		Controlled[3]	
	1960-62	1971-74	1960-62	1971-74	1960-62	1971-74	1960-62	1971-74
	Percent of population[4]		Percent of hypertensives[4]					
All people 35-37 years[5] ..	28.8	31.9	51.1	44.1	28.1	39.0	10.5	16.5
White male	25.3	30.3	58.4	56.2	20.4	27.6	7.2	12.1
White female...............	28.0	29.1	46.6	41.1	33.1	42.1	14.2	19.0
Black male	42.0	49.8	60.6	44.6	19.5	33.1	3.2	15.5
Black female...............	52.5	54.4	34.7	32.4	41.2	46.1	12.9	15.0

[1] Elevated blood pressure (i.e., a systolic measurement of at least 160 millimeters of mercury or a diastolic measurement of at least 95 millimeters of mercury) or taking anti-hypertensive medication.

[2] Reported never having high blood pressure.

[3] Subset of "on medication"; taking anti-hypertensive medication and did not have elevated blood pressure when examined.

[4] Age adjusted by the direct method to the 1971-74 National Health and Nutrition Examination Survey population.

[5] Includes all other races not shown separately.

SOURCE: Division of Health Examination Statistics, National Center for Health Statistics: Data from the 1960-62 National Health Examination Survey and the 1971-74 National Health and Nutrition Examination Survey.

and white people was small in all cases. However, awareness, treatment, and control were generally higher among women than men.

Although the results based on these national surveys are limited, several studies have shown substantial improvement in awareness, treatment, and control of hypertension in specific localities where educational efforts have been intensive:

- In a study of a population screening program in Connecticut, D'Atri et al. (1980) reported a steady increase between 1974 and 1976 in the proportion of hypertensives under control.
- Berkson et al. (1980) found substantial improvement in hypertension control in Chicago between 1972 and 1977.
- Two household surveys of black people in West Baltimore showed a substantial increase in control of hypertension between 1971 and 1973 (Apostolides et al., 1978).

Barriers to Effective Hypertension Control

The value of antihypertensive drug therapy has been well-documented. However, the control of hypertension is complicated by a number of factors. The knowledge the hypertensive patient has regarding the characteristics and medical consequences of high blood pressure could mean the difference between controlled or uncontrolled hypertension. For example, although high blood pressure is not usually accompanied by symptoms (Weiss, 1972), some people have the misconception that it is. More than one-half the hypertensive population surveyed in 1974 claimed that they could tell when their blood pressure was high (National Center for Health Statistics, 1978). While this misconception now appears to be less prevalent, in 1979, one-third of the hypertensive population still believed that hypertension was accompanied by symptoms (Urban Behavioral Research Associates, Inc., 1980).

Another problem regarding control is noncompliance with doctor's orders regarding medication. The 1974 National Health Interview Survey found that about three-quarters of the people who reported they currently had high blood pressure had been prescribed antihypertensive medication at least once. Among all those for whom medication was prescribed, one-quarter had stopped taking it. Of the people who had stopped, about half were advised by a doctor to do so (National Center for Health Statistics, 1978). By 1979, no appreciable change in the proportion who stopped taking medication was evident, although a smaller proportion of those who stopped attributed their actions to a doctor's advice (Urban Behavioral Research Associates, Inc., 1980).

Excess sodium, from either high intake or problems in excretion, tends to increase the blood pressure level of a hypertensive person, while the restriction of salt intake tends to decrease the blood pressure (Freis, 1976). Unfortunately, only about one-half of the hypertensive population reported having received advice from a health care provider to use less table salt. Among hypertensives told to use less salt, more than three-fourths reported using less. In contrast, only about 1 in 4 hypertensive persons not advised to use less salt had restricted its use (National Center for Health Statistics, 1978). Although more hypertensives (nearly 70 percent) reported being told to reduce salt intake in 1979, there appears to have been a slight increase in actual use of salt (Urban Behavioral Research Associates, Inc., 1979).

Although smoking has not been shown to raise blood pressure levels, the risk of a cardiovascular death is much greater for a hypertensive person who smokes than for a hypertensive person who does not smoke (Levy, 1978). Data from the National Health Interview Survey show that proportionately fewer hypertensive people smoke than nonhypertensive people (3 in 10 hypertensives, compared with 4 in 10 nonhypertensives). However, only 1 in 3 hypertensive smokers had been advised by a doctor to stop smoking, compared with 1 in 5 nonhypertensive smokers (National Center for Health Statistics, 1978). Although 1979 data indicate a greater proportion of hypertensives have been advised to stop smoking and have actually stopped, the proportion who smoke more than one pack of cigarettes per day has increased (Urban Behavioral Research Associates, Inc., 1980). The connection between smoking, hypertension, and death has either not been adequately communicated to people with hypertension, or some people, aware of the greater risks of dying among hypertensives who smoke, still choose not to stop smoking.

Summary

Hypertension, which affects some 60 million Americans, is one of the chief factors related to ischemic heart disease (the Nation's number one killer) and stroke (the third ranked killer). The steady decline in cardiovascular disease mortality that began in the 1950's has accelerated during the past decade, and public awareness of hypertension and its detection, treatment, and control has also improved.

Great strides have been made toward controlling hypertension, particularly during the last 10 years. The results of carefully planned clinical trials provide convincing evidence that hypertension can be controlled and that control leads to reduced mortality. The widespread application of the results of these trials should result in still better control of hypertension and further reduction in cardiovascular mortality.

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Section II

Utilization of Health Resources

Use of Ambulatory Care by the Poor and Nonpoor[a]

Overview

The Medicare and Medicaid programs were established in 1965 to improve access to medical care among the aged and the poor. This section examines the changes that have taken place since 1964 in the use of certain ambulatory medical and dental services by the poor and nonpoor.

Data from the National Health Interview Survey (NHIS) of 1964, 1973, and 1978, from Cycle II and Cycle III of the National Health Examination Survey (NHES), and from the National Health and Nutrition Examination Survey (NHANES) are used in this analysis. Determination of poor or nonpoor status is based on total family income, including the income of all related household members. NHIS collects income data in rather broad income categories that make it difficult to precisely adjust the data for changes over time in the value of the dollar or the rise in family income levels. Following Wilson and White (1977), the poor are defined as those people whose family income was in the lowest 20 percent of the population. Respondents with income not stated (about 5 percent in 1964 and 10 percent in 1978) were omitted. For 1964, persons with family incomes of under $3,000 are designated as poor (19.1 percent of the population). For 1973, the cutoff is at $6,000 (21.7 percent of the population), and for 1978, the cutoff is at $7,000 (20.5 percent of the population). Note that this method of classifying the population differs from the official poverty designation. The official definition uses different income cutoffs depending upon family size and composition, sex and age of the family head, and farm or nonfarm residence. According to the official definition, 11 percent of the 1978 population had incomes below the poverty level, whereas in this report, 20 percent of the 1978 population are classified as poor. Another important difference between the two methods is the variation in poverty rate by age. For example, in 1978, 14 percent of people 65 years of age and over had incomes below the official poverty level, while in this report, about half the elderly population are classified as poor.

The poor or nonpoor status of NHES Cycles II and III and NHANES respondents was determined in a manner similar to that used for the NHIS data. For NHES Cycle II, the income distribution for 1964 (the midpoint of the data collection interval) was used to determine poor or nonpoor status. Twenty percent of the population had incomes of $3,000 or less. For NHES Cycle III, the population in 1968 was used, and 19 percent of the population had incomes of $4,000 or less. Twenty percent of the population for 1972-73 had incomes of $5,000 or less, and this cutoff was used for the NHANES population.

In this section, health care utilization by the poor and nonpoor is compared over time to determine whether any change has occurred in the extent to which income affects utilization. However, such comparisons reflect not only the effects of income on health and access to medical care, but also the income-depressing effects of illness. Adults with chronic conditions tend to have a greater number of disability or sick days and, as a result, they often lose income. These individuals also have relatively large numbers of physician visits. This income-depressing effect of illness is particularly evident among people 45-64 years of age. An attempt has been made to adjust for the income-depressing effect of health so that the relationship between income and utilization can be interpreted as reflecting the potential effect of income on access to care. However, it has not been possible to entirely eliminate the effect of health on income.

Physician Visits

Since 1964, a marked reduction has occurred in the percent of the population having no physician visits in the 2 years preceding interview (table A). This decline has occurred in all age and color groups, but the greatest decline was evident among the poor, particularly people under 17 years of age in the all

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[a] Prepared by Jennifer Madans, Ph.D., and Joel C. Kleinman, Ph.D., National Center for Health Statistics.

Table A. Persons with no physician visits during past 2 years, according to age, color, and economic status: United States, 1964, 1973, and 1978

Age and year	Total		White		All other	
	Poor	Nonpoor	Poor	Nonpoor	Poor	Nonpoor
	Percent of population					
All ages[1]						
1964	28.2	17.9	26.1	17.3	32.1	25.1
1973	17.1	13.5	16.5	13.3	17.9	15.4
1978	14.3	12.9	14.5	12.9	13.4	12.6
Under 17 years						
1964	33.2	15.1	28.9	14.1	39.4	24.6
1973	18.7	11.9	16.8	11.4	21.8	16.9
1978	12.9	10.0	12.6	9.8	13.3	11.8
17-44 years						
1964	24.2	18.1	23.2	17.7	26.6	22.9
1973	13.4	12.8	13.1	12.7	14.5	13.5
1978	13.4	14.1	13.7	14.1	12.5	13.4
45-64 years						
1964	29.2	21.7	28.0	21.3	33.1	29.0
1973	20.6	16.9	21.4	16.9	17.0	16.9
1978	17.9	15.5	19.0	15.8	14.1	12.3
65 years and over						
1964	24.0	18.7	23.8	18.3	25.8	26.3
1973	18.0	14.5	17.7	14.5	19.7	14.1
1978	14.4	12.8	14.3	12.8	15.2	12.8

[1] Age adjusted by the direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

NOTE: Definition of poor and nonpoor are based on family income for each year as follows:

Year	Poor	Nonpoor
1964	less than $3,000	$3,000 or more
1973	less than $6,000	$6,000 or more
1978	less than $7,000	$7,000 or more

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

other color group. As a result, the differential between the poor and nonpoor has narrowed, although the proportion with no physician visits remains smaller among the nonpoor than among the poor in most age and color groups.

A second measure of utilization is the average number of physician visits per person per year. This measure is probably more sensitive to morbidity levels than is the proportion of the population with no physician visits in the 2 years preceding interview. Higher frequencies of disease as well as more severe maladies require more frequent visits, whereas whether or not any visit took place is more sensitive to the use of services for preventive purposes.

In 1964, the nonpoor had more visits per person per year than the poor in all age and color groups, except for people 45-64 years of age (table B). By 1973, the number of visits for the poor generally exceeded that for the nonpoor, except among the elderly. For white people 65 years of age and over, the poor had fewer visits than the nonpoor in 1973, but the gap between the two had narrowed. For all other elderly, however, the gap between the poor and nonpoor did not narrow until 1978. Although the differential between poor and nonpoor children was virtually eliminated by 1973, children of races other than white continued to have fewer visits than their white counterparts through 1978.

These variations in utilization do not take into account the level of morbidity in each subpopulation. The greater number of visits for the poor may reflect higher levels of illness. To adjust for this possibility, the percent of the population with limitation of activity from chronic illness is used as a crude measure of morbidity. It must be stressed that adjusting utilization rates by this measure in no way provides a

Table B. Physician visits per person per year, according to age, color, and economic status: United States, 1964, 1973, and 1978

Age and year	Total		White		All other	
	Poor	Non-poor	Poor	Non-poor	Poor	Non-poor
			Number of visits			
All ages[1]						
1964	3.9	4.8	4.2	4.9	3.3	3.9
1973	5.3	5.0	5.4	5.1	5.3	4.6
1978	5.6	4.7	5.7	4.7	5.6	4.5
Under 17 years						
1964	2.3	4.0	2.6	4.1	1.9	2.4
1973	3.8	4.3	4.2	4.4	3.2	2.9
1978	4.0	4.2	4.3	4.3	3.5	3.3
17-44 years						
1964	4.1	4.7	4.5	4.8	3.3	4.2
1973	5.7	5.0	5.8	5.0	5.6	4.8
1978	5.8	4.4	5.7	4.4	6.1	4.8
45-64 years						
1964	5.1	5.1	5.2	5.1	4.9	4.6
1973	6.3	5.4	6.1	5.4	7.1	5.3
1978	7.5	5.0	7.6	5.0	7.3	4.8
65 years and over						
1964	6.0	7.3	6.2	7.3	4.9	6.5
1973	6.5	6.9	6.4	6.8	7.0	8.6
1978	6.2	6.8	6.2	6.8	6.8	7.0

[1] Age adjusted by the direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

NOTE: Definition of poor and nonpoor are based on family income for each year as follows:

Year	Poor	Nonpoor
1964	less than $3,000	$3,000 or more
1973	less than $6,000	$6,000 or more
1978	less than $7,000	$7,000 or more

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

total adjustment of utilization rates for the level of morbidity. The adjustment does not take into account morbidity from acute conditions, the severity of morbidity, nor the incidence of symptoms requiring medical attention. It is used to illustrate the potential effects which could result from a more appropriate adjustment if one were available.

The method of adjustment used was to compare the observed number of physician visits for a particular subgroup with its "expected" number. The ratio of observed-to-expected number of physician visits was used as a morbidity-adjusted utilization index for each age, color, and income subgroup. Finally, the poor and nonpoor differential is expressed as the ratio of the poor-to-nonpoor index for each age or color subgroup. The expected number is computed by applying the number of physician visits observed in 1974 for all people by age and limitation of activity status (National Center for Health Statistics, 1976) to the proportion of the subgroup with limitation of activity. For example, 54.2 percent of poor white people 65 years of age and over reported activity limitation in 1964; 45.8 percent reported no limitation. The 1974 NHIS found that people with limitation of activity in this age group reported an average of 9.3 visits and those without limitation of activity reported an average of 4.6 visits. Thus, the expected number of physician visits for poor white people 65 years of age and over for 1964 was 7.15 (.542 x 6.2, .458 x 4.6 = 7.15). The observed number of visits for this group in 1974 was 6.2, resulting in an observed-to-expected ratio of 0.87. Following the same procedure for nonpoor white people 65 years of age and over in 1964, an observed-to-expected ratio of 1.10 was calculated. The adjusted poor-to-nonpoor ratio for white people

Table C. Poor-to-nonpoor physician visit ratios, according to age and color: United States, 1964, 1973, and 1978

Age and year	Total[1]		White		All other	
	Unadjusted ratio	Adjusted ratio	Unadjusted ratio	Adjusted ratio	Unadjusted ratio	Adjusted ratio
All ages[2]						
1964	0.81	0.86	0.86	0.91	0.85	0.78
1973	1.06	1.03	1.06	1.04	1.15	1.04
1978	1.19	1.11	1.21	1.16	1.24	1.09
Under 17 years						
1964	0.58	0.57	0.63	0.62	0.79	0.80
1973	0.88	0.88	0.95	0.94	1.10	1.08
1978	0.95	0.93	1.00	0.98	1.06	1.04
17-44 years						
1964	0.87	0.80	0.94	0.86	0.79	0.71
1973	1.14	1.06	1.16	1.08	1.17	1.05
1978	1.32	1.21	1.30	1.19	1.27	1.13
45-64 years						
1964	1.00	0.80	1.02	0.81	1.07	0.84
1973	1.17	0.90	1.13	0.87	1.34	1.01
1978	1.50	1.16	1.52	1.18	1.52	1.18
65 years and over						
1964	0.82	0.75	0.85	0.79	0.75	0.69
1973	0.94	0.87	0.94	0.87	0.81	0.76
1978	0.91	0.85	0.91	0.85	0.97	0.88

[1] Unadjusted and adjusted for chronic illness.

[2] Age adjusted by the direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

NOTE: Definition of poor and nonpoor are based on family income for each year as follows:

Year	Poor	Nonpoor
1964	less than $3,000	$3,000 or more
1973	less than $6,000	$6,000 or more
1978	less than $7,000	$7,000 or more

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

65 years of age and over in 1964 would be .87-to-1.10 or .79 as shown in table C. Adjusted ratios of less than 1 indicate that the poor in that age and color group have fewer visits than the nonpoor after adjusting for the proportion with limitation of activity. Unadjusted poor-to-nonpoor ratios were calculated directing from the visit rates reported in table B. Differences between the unadjusted and adjusted ratios reflect the adjustment for the differences in the proportion with limitation of activity in the two income groups.

In almost all cases, the adjusted ratios are less than the unadjusted ratios, indicating the greater level of morbidity among the poor. In 1978, the reduction was especially large in the group 45-64 years of age where, for both white and all other people, the poor had 52 percent more visits than the nonpoor but, after adjusting for limitation of activity, the poor had 18 percent more visits. If a more appropriate measure were available, it is possible that the poor would have fewer visits than the nonpoor for the same level of morbidity. Both adjusted and unadjusted poor-to-nonpoor physician visits ratios increased from 1964 to 1978, thus indicating that the poor have increased their use of medical services relative to the nonpoor.

Dental Care

The trend toward equal use of ambulatory medical services for the poor and the nonpoor is not evident in the use of dental services (table D). The proportion of the poor with no dental visits during the 2 years preceding interview decreased from 62 percent in 1964 to about 49 percent in 1978 compared with a decrease from 41 to 33 percent among the nonpoor during the same period. While the differential between the poor and nonpoor decreased slightly

Table D. Persons with no dental visits during past 2 years, according to age, color, and economic status: United States, 1964, 1973, and 1978

Age and year	Total		White		All other	
	Poor	Non-poor	Poor	Non-poor	Poor	Non-poor
	Percent of population					
All ages[1]						
1964	62.5	40.9	57.7	39.[illegible]	72.8	59.2
1973	53.2	35.9	51.0	3[illegible].4	59.4	51.2
1978	49.4	33.3	47.3	32.2	55.1	44.4
Under 17 years						
1964	73.2	44.7	66.6	42.5	82.9	66.3
1973	58.3	37.2	55.8	35.2	62.2	55.6
1978	51.6	35.2	49.9	33.7	54.3	47.3
17-44 years						
1964	46.3	30.1	40.2	28.5	61.3	48.1
1973	38.9	28.1	35.9	26.8	48.5	40.6
1978	36.3	26.6	33.0	25.4	45.8	37.1
45-64 years						
1964	66.7	43.6	65.0	42.6	72.6	59.7
1973	61.5	38.3	60.5	37.4	65.1	51.1
1978	59.7	34.3	58.9	33.5	62.3	43.8
65 years and over						
1964	78.5	63.5	78.0	62.9	83.0	76.6
1973	72.8	55.9	72.0	54.7	79.2	76.8
1978	69.4	50.6	68.1	49.8	78.1	64.2

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[1] Age adjusted by the direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

NOTE: Definition of poor and nonpoor are based on family income for each year as follows:

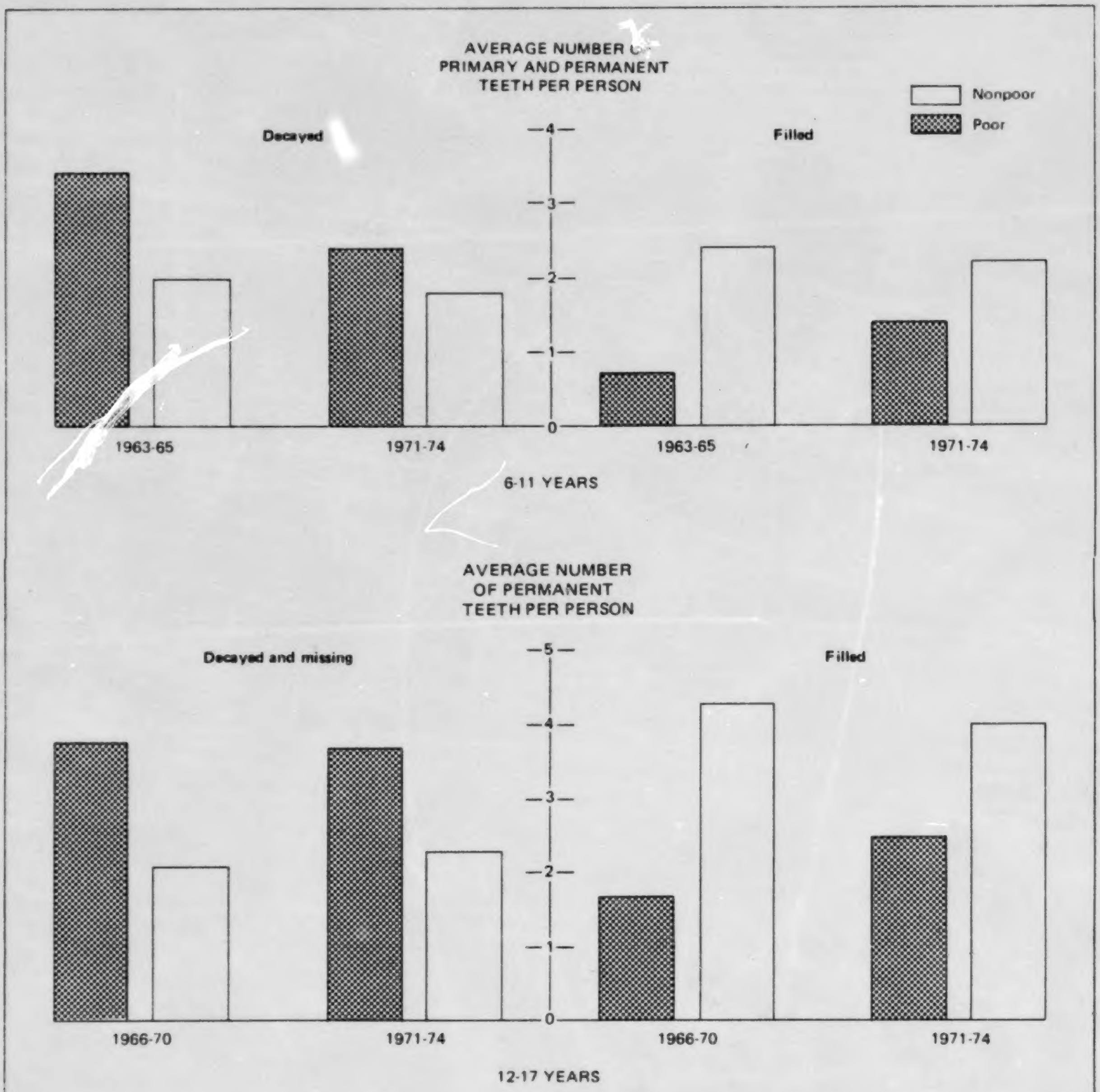
Year	Poor	Nonpoor
1964	less than $3,000	$3,000 or more
1973	less than $6,000	$6,000 or more
1978	less than $7,000	$7,000 or more

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

among people under 45 years of age, the gap increased slightly among those 45 years of age and over.

This measure of utilization of dental services does not take the need for dental services into account. In the section on medical care, a summary measure of health status was used as an indicator of need. In analyzing the use of dental services, need will be measured only in relation to one dental condition—dental caries. Other dental conditions, such as malocclusion and periodontal disease, are not addressed. Since caries are most common among children, the analysis is restricted to those 6-17 years of age. Data from the National Health Examination Surveys can be used to compare unmet need for dental services for treatment of caries by income level. Unmet need for caries treatment is measured by the average number of decayed primary and permanent teeth found at the dental exam for those 6-11 years of age and the average number of decayed and missing permanent teeth found for those 12-17 years of age. Data for the earlier time period for children 6-11 years of age were collected from 1963 to 1965 as part of NHES Cycle II. For those 12-17 years of age, the data were collected from 1966 to 1970 as part of NHES Cycle III. Data for the most recent period for both children 6 to 11 years of age and youth 12-17 years of age were collected as a part of NHANES from 1971 to 1974.

The greater contact with dentists found among the nonpoor compared with the poor is consistent with the lower level of unmet need for treatment of caries found among children and youth in the nonpoor category. Moreover, just as little change has occurred in the differential in utilization between the poor and nonpoor over time, little change has been evident in the relationship between unmet need for caries treatment and income (figure 1).



SOURCES: National Center for Health Statistics: Data for 1963-65 and 1966-70 from the National Health Examination Survey, Cycle II and Cycle III; data for 1971-74 from the National Health and Nutrition Examination Survey.

Figure 1. Decayed, missing, and filled teeth among children 6-11 and 12-17 years of age, according to economic status: United States, selected years 1963-74

Whereas the number of decayed or missing teeth is a measure of unmet need for treatment of dental caries, the number of filled teeth represents, in part, the extent to which needed dental treatment has been obtained. The average number of filled teeth per person was greater among the nonpoor for children 6-11 years of age and youth 12-17 years of age for both periods of time. The greater number of filled teeth among those in the higher income group is consistent with the higher rate of contact that the nonpoor have with dentists.

Discussion

Substantial changes in the utilization of ambulatory medical services by the poor and nonpoor occurred from 1964 to 1978. In all age and color groups, the poor had greater increases in the utilization of ambulatory medical services than did the nonpoor. The most plausible explanation of these trends is the establishment of Medicare, Medicaid, and other public health programs in the mid to late 1960's. This explanation is given further credence by the persistence of differentials between the poor and nonpoor in the use of dental services for the treatment of caries and the prevalence of unmet need for this treatment because large-scale programs to reduce financial barriers to dental care were not similarly established.

Although the trend toward equality of utilization by income has been fairly well established, it is more difficult to determine whether the level of utilization is commensurate with need. When utilization rates were partially adjusted for differences in morbidity, the poor-to-nonpoor physician visit ratios diminished, although they were still greater than 1 for the two middle age groups (17-44 and 45-64 years of age). However, the adjustment procedure used only partially accounted for differences in morbidity. An adjustment which would more accurately reflect need for medical care would undoubtedly further reduce, if not eliminate or reverse, the greater utilization among the poor. While some investigators have found a trend toward equity as well as equality (Aday, Andersen, and Fleming, 1980), others have found that after adjusting for need, the poor use fewer services than the nonpoor (Davis and Reynolds, 1976; Andersen, Kravits, and Anderson, 1975).

The pattern in the utilization of ambulatory care services described in this section is affected by a wide range of factors in addition to those discussed here, and the interrelationships among these factors are fairly complex. Certain findings require more in-depth exploration. For example, in nearly all age and color groups, the poor-to-nonpoor physician visit ratios increased between 1973 and 1978 as well as between 1964 and 1973. Since Medicare and Medicaid were enacted in 1964, it might have been expected that the effect on utilization would be greatest during the earlier period and would have leveled off during the latter period. The continued increase in the ratio from 1973 to 1978 may be explained, however, by the continuing expansion of Medicaid enrollment throughout this period. In 1970, the ratio of Medicaid recipients to the population below the poverty level was .59. By 1976, the ratio increased to .91. Furthermore, there has been an expansion of Federal programs designed to increase the availability of primary care providers in manpower shortage areas.

The finding that, of all age groups, the poor 65 years of age and over showed the smallest increases in utilization relative to the nonpoor also requires some additional comment. Since the elderly poor had both Medicare and Medicaid available, it might have been expected that this group would show the greatest increases. Although elderly people in the all other color group showed a trend toward equal utilization, especially between 1973 and 1978, the poor and nonpoor difference among elderly white people was only slightly smaller in 1978 than in 1964. One possible explanation is that the greatest effects of the Medicare program were in hospital care—the increase in hospital days among the elderly poor was 31 percent between 1963-65 and 1976-78, compared with a 12-percent increase among the poor 45-64 years of age. Furthermore, the method used to define poor resulted in about half the elderly population being so classified.

In this section, the emphasis has been on trends in the utilization of ambulatory health care; no attempt has been made to document the differences which exist in the type of care received or in the quality of that care. For example, the poor are much more likely to obtain care from hospital outpatient departments than are the nonpoor (table 31).

The poor are also less likely to use preventive care services than people with higher incomes (National Center for Health Statistics, 1977). In 1978, the proportions of children vaccinated against polio and the childhood diseases were lower among children living in poverty areas than those living outside poverty areas (Center for Disease Control, 1979). In addition, mothers with low educational attainment are much less likely to begin prenatal care in the first trimester of pregnancy than mothers with higher educational levels (income differentials are unavailable but women with low educational attainment are more likely to have low incomes than other women). Among white births in 1978, 84 percent of mothers who were high school graduates began prenatal care in the first trimester of pregnancy, compared with 61 percent of those who were not graduates. Among black births, the corresponding proportions were 67 percent and 50 percent.

More important, however, is whether the quality of ambulatory care as measured by health outcome is comparable between the poor and nonpoor. Unfortunately, little information is available on this issue. One study, however, suggests that hospitalized patients who were not covered by commercial insurance or Medicaid had significantly more complications upon admission than those who were covered (Gonnella, Louis, and McCord, 1976). The authors attribute some of this difference to the lack of access to quality of ambulatory care.

In summary, although substantial progress has been made in reducing barriers to medical care among the poor, no definitive evidence exists as to whether or not the poor are receiving adequate care, in terms of both quantity and quality, relative to their need. Furthermore, the poor are much less likely to receive dental care. Poor children have significantly greater unmet need for the treatment of dental caries as measured by direct examination than do nonpoor children.

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Regional and Income Differentials in Surgery[a]

Overview

Two antithetical issues in the health care field have generated a great deal of concern during the past 15 years. On the one hand, the lack of access to medical care, especially by the aged and the poor, led to a greatly increased role for Federal and State governments in payment for personal health services. On the other hand, a growing awareness developed of the need to control "unnecessary" utilization of medical care to contain costs and improve quality. The latter concern has been especially evident in the area of surgery. Several studies have shown wide variations between countries, among geographic areas within the United States, and between prepaid and fee-for-service practices in the rates of surgery (Bunker, 1970; Lewis, 1969; Riedel et al., 1975; Wennberg and Gittelsohn, 1975). Furthermore, the Subcommittee on Oversight and Investigations of the Committee on Interstate and Foreign Commerce, U.S. House of Representatives, concluded that approximately 2 million unnecessary surgical procedures were performed in 1977, costing more than $4 billion and 10,000 lives (U.S. Congress, 1978).

This section presents national data on the rates of surgery, according to age, geographic region, and income level for two time periods, 1963-65 (before Medicare and Medicaid) and 1976-78. Data were obtained from the National Health Interview Survey (NHIS) of the National Center for Health Statistics. The NHIS is a continuing nationwide sample survey in which data are collected through personal household interviews. The usual NHIS sample is about 116,000 persons in 40,000 interviewed households in a year. Rates of surgery represent the number of persons with at least one surgical procedure in the year preceding interview per 1,000 population. Multiple operations on the same person are counted only once.

To control for the general rise in income levels between the two time periods, respondents were divided into two groups: poor and nonpoor. Poor was defined as those with family income below $3,000 for 1963-65 (20.3 percent of the population) and below $7,000 for 1976-78 (22.4 percent of the population). Respondents with income not stated (5.2 percent for 1963-65 and 9.3 percent for 1976-78) were omitted from poor and nonpoor comparisons. Note that this method of classifying the population differs from the official poverty designation. The official definition used different income cutoffs depending upon family size and composition, sex and age of the family head, and farm or nonfarm residence. According to the official definition, 11 percent of the 1978 population had incomes below the poverty level, whereas in this report, 20 percent of the 1978 population are classified as poor. Another important difference between the two methods is the variation in poverty rate by age. For example, in 1978, 14 percent of people 65 years of age and over had incomes below the official poverty level, while in this report, about half the elderly population are classified as poor.

The discussion is limited to overall rates of surgery. Except for children under 15 years of age, specific procedures were not analyzed because of the small number of cases.

Results

There were substantial variations among age groups in surgery rates and changes in these rates during the 15-year period studied (table A). Between 1963-65 and 1976-78, the rate of surgery increased by 63 percent for the elderly, but it decreased by 8 percent for children under 15 years of age. Much of this decrease in surgery among children resulted from a 50-percent reduction in tonsillectomies, which accounted for about 40 percent of all surgical procedures among children in 1965. Each age group will be considered separately in examining regional and income differentials over time.

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[a] Prepared by Steven R. Machlin and Joel C. Kleinman, Ph.D., National Center for Health Statistics.

Table A. Persons with at least one operation per 1,000 population and percent change, according to age: United States, 1963-65 and 1976-78

Age	1963-65	1976-78	Percent change
	Number per 1,000 population		
All ages	48.9	59.5	21.7
Under 15 years	31.8	29.3	-7.9
15-44 years	51.2	57.0	11.3
45-64 years	64.5	77.6	20.3
65 years and over	64.1	104.7	63.3

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

Children Under 15 Years of Age

In the early 1960's, the rate of surgery for children under 15 years of age in the South was substantially below that of any other geographic region (table B). This was especially apparent for poor children in the South, whose rate of surgery (12.4 per 1,000 population under 15 years of age) was less than half that of poor children in any other region. Rates for nonpoor children in the South were only slightly lower than for those in the other regions. Consequently, the differential between poor and nonpoor rates for 1963-65 was greatest in the South (a ratio of .40) while the differentials for the other regions were less pronounced (ratios ranging from .83 to .85).

Table B. Persons with at least one operation per 1,000 population under 15 years of age, according to income level and geographic region: United States, 1963-65 and 1976-78

Year and income level	Geographic region				
	United States	North-east	North Central	South	West
1963-65	Number per 1,000 population				
All incomes[1]	31.8	35.8	34.4	26.1	32.3
Poor	20.1	30.8	29.4	12.4	28.1
Nonpoor	34.3	37.2	35.4	31.3	33.0
1976-78					
All incomes[1]	29.3	27.0	30.5	31.3	26.6
Poor	26.6	22.8	29.5	27.5	25.1
Nonpoor	31.0	28.6	32.2	33.7	27.6

[1] Includes income not stated.

NOTE: For 1963-65, poor was defined as family income below $3,000 and nonpoor as family income of $3,000 or more; for 1976-78, poor was defined as family income below $7,000 and nonpoor as family income of $7,000 or more.

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

Surgery rates for poor Southern children have increased markedly during the past 15 years. Between 1963-65 and 1976-78, rates more than doubled for this group while remaining fairly stable for nonpoor children. Therefore, by 1978, the ratio between poor and nonpoor surgery rates for children in this region was .82; a ratio comparable to those observed in the other regions.

For 1976-78, no significant variation existed among regions in their ratios of poor to nonpoor rates. However, the North Central and South Regions had higher rates than the Northeast and West Regions for both the poor and nonpoor.

Tonsillectomy is the most frequently performed operation for children under 15 years of age. It is also a controversial procedure in that it is often used as an example of unnecessary surgery. Between 1963-65 and 1976-78, the tonsillectomy rate was halved from 14.6 to 7.1 persons per 1,000 population (table C). This reduction accounts for the overall decline in surgery among children (a 29-percent increase occurred in the rate of operations other than tonsillectomy). However, the tonsillectomy rate increased by 15 percent among poor children, while it declined by 52 percent among the nonpoor. The net effect of all these shifts in rates was that for 1976-78 tonsillectomy accounted for roughly 25 percent of all operations among both poor and nonpoor children. This figure is similar to that observed for the poor for 1963-65, but half that observed for the nonpoor

Table C. Persons with tonsillectomy as only operation per 1,000 population under 15 years of age, according to income level and geographic region: United States, 1963-65 and 1976-78

Year and income level	Geographic region				
	United States	North-east	North Central	South	West
1963-65	Number per 1,000 population				
All incomes[1]	14.6	17.2	15.8	11.0	15.9
Poor	5.9	(2)	(2)	(2)	(2)
Nonpoor	16.4	(2)	(2)	(2)	(2)
1976-78					
All incomes[1]	7.1	7.5	8.1	7.6	4.6
Poor	6.8	(2)	(2)	(2)	(2)
Nonpoor	7.8	(2)	(2)	(2)	(2)

[1] Includes income not stated.
[2] Sample size too small to provide reliable estimates.

NOTE: For 1963-65, poor was defined as family income below $3,000 and nonpoor as family income of $3,000 or more; for 1976-78, poor was defined as family income below $7,000 and nonpoor as family income of $7,000 or more.

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

for 1963-65. If tonsillectomies were excluded, both the poor and nonpoor would show substantial increases in surgery rates during the 15-year period (39 percent and 30 percent, respectively).

The West showed the most rapid decline in tonsillectomy rates (71 percent) while the South showed the smallest (31 percent). Thus, although the South initially had the lowest rate, for 1976-78 its rate was comparable to that of the Northeast and North Central Regions. The West had a significantly lower tonsillectomy rate than any of the other regions. If tonsillectomies were omitted, the Northeast would have the lowest surgical rate for 1976-78.

Adults 15-44 Years of Age

For 1963-65, the poor in the South had 20 percent less surgery than the nonpoor (table D), while the poor and nonpoor in the North Central and West Regions had similar rates. Only in the Northeast was the rate of surgery higher for the poor. For 1976-78, the situation had changed and the poor experienced substantially more surgery than the nonpoor in every region.

Among the nonpoor, those in the Northeast and North Central Regions had lower rates of surgery than those in the South and West Regions for 1963-65. However, the West experienced the smallest increase among the poor with a decrease among the nonpoor, resulting in the lowest rates of surgery for 1976-78. The North Central Region, on the other hand, showed relatively large increases so that it had among the highest rates for 1976-78.

Table D. Persons with at least one operation per 1,000 population 15-44 years of age, according to income level and geographic region: United States, 1963-65 and 1976-78

Year and income level	Geographic region				
	United States	Northeast	North Central	South	West
1963-65	Number per 1,000 population				
All incomes[1]	51.2	47.8	48.4	53.9	56.0
Poor	47.5	54.5	44.4	44.5	56.6
Nonpoor	52.4	47.9	49.2	57.8	56.3
1976-78					
All incomes[1]	57.0	55.7	59.4	61.4	47.7
Poor	66.4	66.9	72.4	65.4	60.1
Nonpoor	55.9	53.3	57.9	61.8	46.1

[1] Includes income not stated.

NOTE: For 1963-65, poor was defined as family income below $3,000 and nonpoor as family income of $3,000 or more; for 1976-78, poor was defined as family income below $7,000 and nonpoor as family income of $7,000 or more.

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

Adults 45-64 Years of Age

Between 1963-65 and 1976-78, surgery rates increased for both the poor and nonpoor in all regions, but at faster rates for the poor (table E). For 1963-65, rates were between 10 and 20 percent lower in the North Central and West Regions for the poor than for the nonpoor, but they were more than 40 percent lower in the South. For 1976-78, rates for the poor surpassed those of the nonpoor in the Northeast, North Central, and West Regions, while the rate for the poor remained 10 percent lower than for the nonpoor in the South.

For 1963-65, rates for the poor in the Northeast Region were higher than for those in any other region, while rates for the nonpoor were slightly lower. Furthermore, the Northeast was the only region with higher rates for the poor than nonpoor in the early 1960's. However, for 1976-78, rates for the Northeast were similar to the West for both the poor and nonpoor. In the late 1970's, the North Central Region had a high rate for the nonpoor.

Table E. Persons with at least one operation per 1,000 population 45-64 years of age, according to income level and geographic region: United States, 1963-65 and 1976-78

Year and income level	Geographic region				
	United States	Northeast	North Central	South	West
1963-65	Number per 1,000 population				
All incomes[1]	64.5	64.2	65.9	61.9	67.5
Poor	52.9	73.1	57.5	41.9	60.2
Nonpoor	68.8	64.5	69.0	72.9	70.0
1976-78					
All incomes[1]	77.6	72.0	82.8	79.0	75.2
Poor	86.1	86.3	101.2	77.5	86.1
Nonpoor	78.6	71.4	80.8	85.3	74.8

[1] Includes income not stated.

NOTE: For 1963-65, poor was defined as family income below $3,000 and nonpoor as family income of $3,000 or more; for 1976-78, poor was defined as family income below $7,000 and nonpoor as family income of $7,000 or more.

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

Adults 65 Years of Age And Over

Since the early 1960's, surgical rates have been rising fastest for the elderly, especially the elderly poor. This increase is evident even after adjusting for the sharp rise in the age composition within the population 65 years of age and over. For 1963-65, the elderly poor received surgery about 80 percent as often as the elderly nonpoor in all regions (table F). Though rates have risen significantly for the nonpoor, surgery rates for the elderly poor have shown even larger increases during the past 15 years. In fact, for 1976-78, the surgical rate for the poor in the Northeast was 26 percent higher than for the nonpoor. In the other regions, the poor had similar or just slightly lower rates than the nonpoor for 1976-78.

The Southern elderly of both income groups tended to have slightly lower surgical rates (approximately 10 percent) than elderly people in the other regions for 1963-65. For 1976-78, the Southern poor still had a lower rate (94.3) than the poor in other regions. However, the rate for the nonpoor in that region (108.2) surpassed that of the nonpoor in the Northeast (88.2) and was similar to that of the nonpoor in the North Central Region (110.2).

Table F. Persons with at least one operation per 1,000 population 65 years of age and over, according to income level and geographic region: United States, 1963-65 and 1976-78

Year and income level	*Geographic region*				
	United States	*North-east*	*North Central*	*South*	*West*
1963-65	*Number per 1,000 population*				
All incomes[1]	64.1	67.0	64.8	58.2	69.0
Poor	57.9	59.8	59.5	54.7	59.1
Nonpoor	72.1	74.9	73.5	67.3	71.4
1976-78					
All incomes[1]	104.7	96.0	109.2	101.4	116.3
Poor	105.1	111.0	114.3	94.3	105.8
Nonpoor	105.3	88.2	110.2	108.2	118.1

[1] Includes income not stated.

NOTE: For 1963-65, poor was defined as family income below $3,000 and nonpoor as family income of $3,000 or more; for 1976-78, poor was defined as family income below $7,000 and nonpoor as family income of $7,000 or more.

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

Discussion

In nearly every age group and every region, surgical utilization increased more rapidly for the poor than the nonpoor between 1963-65 and 1976-78. Compared to the other regions, the South had much greater differentials in surgery between the poor and nonpoor for 1963-65. For 1976-78, however, the ratios of poor to nonpoor rates in the South were more similar to those in the other regions. Except for children under 15 years of age, the poor generally had greater surgical utilization than the nonpoor for 1976-78. The North Central and South Regions generally had among the highest rates of surgery. The Northeast and West tended to have lower surgical rates. However, rates for the elderly in the West were the highest of all regions.

These differentials raise a great many questions that cannot be addressed directly with the limited data currently available. For example, it is difficult to assess the extent to which differentials in utilization are the result of differentials in access to care, individual physician practice patterns, or the incidence of conditions requiring surgery (i.e., "need"). It seems unlikely that substantial regional differences exist in the need for surgery. Differentials in access to medical care, however, may be reflected in these data. For example, black children and the elderly have lower rates of surgery than their white counterparts, even after adjusting for income. This differential is accentuated in the South.

Furthermore, the increase in surgery, especially among the elderly, may partly result from technological advances that make surgery safer and more effective. Thus, the potential benefits of certain procedures may now outweigh their risks, whereas the reverse was the case only 10 or 15 years ago.

Finally, the existence of variations in surgery does not imply the existence of unneccessary surgery. As Bunker (1970) stated in a report comparing surgery in the United States with England and Wales, "indications for surgery are not sufficiently precise to allow determination of whether American surgeons operate too often or British too infrequently." This point of view is also illustrated by the evidence presented by LoGerfo et al. (1979). They suggested that the lower rate of surgery in a plan where physicians were salaried compared with a fee-for-service system resulted from underprovision of appropriate surgical care in the salaried plan as well as unnecessary surgery under fee-for-service.

Classification of operations on a necessity or urgency scale can also be used to compare surgical utilization among population subgroups. Using 1970 NHIS data, Bombardier et al. (1977) found that low income individuals had rates similar to the rest of the population for highly necessary procedures but lower rates for the less necessary procedures. This result was not obtained for the tonsillectomy data presented in table C. For 1976-78, tonsillectomies were performed only slightly less frequently among poor children and represented the same proportion of all operations.

Further analysis of geographic variations in surgery is likely to be most revealing when data for relatively small areas are used (Roos, Roos, and

Henteleff, 1977; Wennberg and Gittelsohn, 1975). Unfortunately, such data are not available for all parts of the Nation, except for persons covered under Medicare. The data presented here, however, clearly show that surgical utilization has increased since 1963-65 for the poor and the elderly. It is likely that this increase is because of the Medicaid and Medicare programs. Substantial variations in the rates of surgery also exist by geographic region and age.

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International Utilization of Hospital Services[a]

Introduction

Hospital utilization rates in the United States are often compared with those in other developed countries, both to evaluate the performance of the U.S. hospital system and to explore the effects of alternative approaches to the organization and financing of health care delivery. In making these comparisons, the number of discharges per 1,000 population is generally found to be higher in the United States, while the mean length of stay is generally lower than in other countries. An accurate interpretation of these findings is difficult, however, because of the different definitions and procedures used by the various countries in collecting and analyzing hospital data.

For one thing, dissimilar types of facilities are reported on in the different countries. Also, the way discharges and bed days are counted varies. As a result, differences that appear in utilization statistics may be misleading. Recently, studies of this problem have been undertaken (Andersen, Anderson, and Kozak, 1979; Kozak, Andersen, and Anderson, 1980; National Center for Health Statistics, 1980b). These studies examine data systems that report on short-term hospitalizations in 10 countries: the United States (where the National Hospital Discharge Survey is used), Australia, Canada, Denmark, England and Wales, Federal Republic of Germany, Finland, France, Scotland, and Sweden. Adjustments are made in the data from each country to allow for the methodological differences in the statistical systems. Although the resulting adjusted utilization rates are not completely comparable, they do allow for a more valid analysis of international differences in utilization than might otherwise be possible.

Utilization Patterns

The adjusted statistics show that all of the 10 countries had 5 or 6 short-term hospital beds per 1,000 population, except the Federal Republic of Germany, which had 8 beds (table A). Greater differences existed in discharge rates from country to country, with a high of 182 per 1,000 persons per year in Australia and a low of 97 per 1,000 in England and Wales. In 5 of the 10 countries, mean stays were between 9.5 and 10.6 days inclusive, but the full range went from 7.6 days in Australia to 16.4 days in the Federal Republic of Germany. Bed-day rates, which are the products of discharge rates and mean stays, fluctuated the most—from 978 bed days per 1,000 persons in England and Wales to 2,317 per 1,000 in the Federal Republic of Germany. The percent occupancy of short-term hospital beds ranged from 59 percent in Australia to 83 percent in the Federal Republic of Germany; however, six countries were within 3 percentage points of the median for all 10 countries, which was 74 percent.

Several different patterns of hospital utilization are evident in the 10 countries. The United States, Australia, and Canada had the highest discharge rates and the shortest mean stays. Discharge rates for Scotland and England and Wales were among the lowest, but their mean stays were average. The Federal Republic of Germany and France reported the highest mean stays, with average or low discharge rates. The mean stays in Finland, Sweden, and Denmark were average, and the discharge rates were average or somewhat above average.

To further illustrate the difference in hospital use from country to country, statistics on patients whose primary discharge diagnosis was either heart disease or cancer and on different age and sex groups are presented. However, unlike the total utilization rates for each country, these statistics have not been adjusted for methodological differences. In all cases, patients treated in long-term units of short-term hospitals are incorporated in the statistics. For certain countries, patients discharged from long-term hospitals are also included. In addition, data are available only for parts of some countries.

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[a] Prepared by Lola Jean Kozak, National Center for Health Statistics.

Table A. Adjusted short-term hospital utilization, according to selected measurements: Selected developed countries, selected years 1973-77

Country and year	Utilization measurement				
	Beds[1]	Discharges[2]	Bed days[2]	Mean stay in days[2]	Bed occupancy rate in percent[1]
	Number per 1,000 population				
United States (1976)	5	168	1,287	7.7	74
Australia (1976-77)	6	182	1,376	7.6	59
Canada (1975)	5	163	1,357	8.3	74
Denmark (1977)	6	159	1,622	10.2	77
England and Wales (1975)	5	97	978	10.1	72
Federal Republic of Germany (1976)	8	141	2,317	16.4	83
Finland (1976-77)	6	154	1,472	9.5	81
France (1976)	6	119	1,568	13.2	76
Scotland (1976-78)	5	123	1,217	9.9	67
Sweden (1973-76)	5	145	1,541	10.6	74

[1] Computed from aggregated data in annual hospital reports.

[2] Computed from discharge reporting system data, which is from individual abstracts of information on each discharge.

NOTE: Statistics exclude hospitals and units for which the mean length of stay was 30 days or more, and/or hospitals and units defined by the countries as long-term.

SOURCES: (Kozak, Andersen, and Anderson, 1980; National Center for Health Statistics, 1978; Health Insurance Commission, Australia, 1978; Hospital Section of Health Division, Statistics Canada, 1978a; National Health Service, Denmark, 1978b; Department of Health and Social Security, 1977; Welsh Office, 1978; Federal Office of Statistics, Federal Republic of Germany, 1979; National Board of Health, Finland, 1978; Ministry of Health and Social Security, France, 1977; Information Services Division of the Common Services Agency, Scottish Health Service, 1979; National Board of Health and Welfare, Sweden, 1978).

Heart Disease and Cancer

Finland and the United States had the highest discharge rates for heart disease among the nine countries for which discharge rates were available (table B). England and Wales, Scotland, and the Federal Republic of Germany had the lowest rates. The mean stay for heart disease patients in the United States was more than 2 days shorter than the next shortest mean stay, and the mean stays in Australia and Finland were also several days less than those in the other countries. The longest mean stays were reported in Sweden, Scotland, and England and Wales, but the statistics from each of these countries included patients discharged from long-term hospitals.

Sweden, Denmark, and Finland had the highest discharge rates for cancer; Canada, England and Wales, and Australia had the lowest. The U.S. rate was about average for the nine countries. The mean stays for cancer patients in the United States and Australia were more than 3 days shorter than those in the other countries. Canada and Sweden had the longest mean stays for cancer, but again, long-term hospital patients were included in the statistics from both these countries.

Age and Sex

The discharge rates for females were higher than the discharge rates for males in the nine countries compared, but much of the difference can be accounted for by hospitalizations for pregnancy, childbirth, and related conditions (table C). If such hospitalizations were excluded, the discharge rates for males and females would be almost identical in four countries; in three other countries, the differences in the rates would be small. In Australia and the United States, however, female rates would remain considerably higher than male rates even if maternity care was excluded.

The mean stays for males and females were similar in most of the countries. Male stays were somewhat longer than female stays in five countries, and female stays were longer in four. In England and Wales and Scotland, female stays were several days longer than male stays; if maternity patients were excluded, the difference would be even greater. If maternity patients were excluded in the other countries, the result would be a higher mean stay for females than for males, except in the United States where no sex difference would exist. The differences in the length of stays by sex would remain small in the other countries.

Discharge rates and the mean length of stays increased with age in all of the countries (table D). Discharge rates for children 14 years of age and under were comparatively high in Australia and Denmark, but the rate for Denmark included healthy newborns, who were excluded from the other countries' rates. The lowest discharge rates for children were reported in Scotland, England and Wales, and

Table B. Discharge rates and mean length of stays for patients with the primary discharge diagnosis of cancer or heart disease: Selected developed countries, selected years 1973-77

Country and year	*Heart disease*		*Cancer*	
	Discharges per 1,000 population	*Mean stay in days*	*Discharges per 1,000 population*	*Mean stay in days*
United States (1977)	14.6	9.7	8.1	12.2
Australia[1] (1976)	8.4	12.1	6.8	12.6
Canada (1975)	10.0	17.9	6.3	20.5
Denmark (1974-75)	8.7	---	9.8	---
England and Wales (1975)	5.5	22.5	6.7	17.2
Federal Republic of Germany[2] (1976)	7.5	17.9	7.0	17.7
Finland (1977)	14.6	13.4	9.2	15.8
France[3] (1976)	---	17.4	---	19.3
Scotland (1976)	7.6	24.0	8.6	16.9
Sweden[4] (1973)	11.5	27.9	11.5	20.4

[1] Statistics are from only three States, Queensland, Western Australia, and Tasmania. Together these States have a higher discharge rate and a lower mean length of stay than does Australia as a whole.

[2] Statistics are estimated using data from the discharge reporting system in one State, Schleswig-Holstein. This State has a lower discharge rate and a lower mean stay than does the country as a whole.

[3] Statistics are from public hospitals only and these hospitals have longer mean stays than do private hospitals.

[4] Statistics are from the Uppsala region and Skåne areas only. Together these areas have a lower mean length of stay than does Sweden as a whole, but their discharge rate is representative of the country as a whole.

NOTES: Primary diagnosis categories are from the *Manual of International Statistical Classification of Diseases, Injuries, and Causes of Death*, based on the Recommendations of the Eighth Revision Conference, 1965. Cancer refers to ICD8 140-209; heart disease to ICD8 390-420. Estimates were made from partial data to obtain the statistics on heart disease in Queensland, Australia, and statistics on cancer in Finland. Long-term hospital patients are included in the statistics from Canada, England and Wales, Scotland, and Sweden.

SOURCES: (National Center for Health Statistics, 1979; Queensland Office, Australian Bureau of Statistics, 1978; Tasmania Office, Australian Bureau of Statistics, 1978; Western Australian Office, Australian Bureau of Statistics, 1977; Hospital Morbidity Section of Health Division, Statistics Canada, 1978b; National Health Service, Denmark, 1978a; Department of Health and Social Security, Office of Population Censuses and Surveys, and Welsh Office, 1978; State Statistical Office of Schleswig-Holstein, Federal Republic of Germany, 1978; National Board of Health, Finland, unpublished data; Gascon and Le Roux, unpublished document; Information Services Division of Common Services Agency, Scottish Health Service, 1978a; National Board of Health and Welfare, Sweden, 1976b).

the United States. The United States rate was particularly noteworthy in light of the high total discharge rate in the United States. Mean length of stays for children were shortest in the United States and Australia and longest in the Federal Republic of Germany.

Hospital use by people 15-64 years of age was similar to the total hospital use in each country. The United States and Australia had the highest discharge rates and shortest mean length of stays. England and Wales had the lowest discharge rate and the Federal Republic of Germany had the longest mean length of stay.

For people 65 years of age and over, Finland and the United States had the highest discharge rates, while England and Wales and the Federal Republic of Germany had the lowest. The mean length of stay for the elderly was more than five days shorter in the United States than in any of the other countries. Also of interest was the comparatively moderate length of stay for the elderly in the Federal Republic of Germany, since it had the longest mean stays for other age groups. The longest mean stays for the elderly were reported by Scotland, England and Wales, and Canada, but the inclusion of long-term hospital patients probably affected these statistics.

The preceding data show substantial differences in hospital use among the countries. While no definitive evidence about the reasons for these differences is available, some possible sources of the differences are examined in the following discussion.

Health Services Systems

Hospital Administration

Variations in hospital utilization rates may be related to differences in the health services systems in the 10 countries. One of the differences is in the type of administration of hospitals. In Denmark, England and Wales, Finland, Scotland, and Sweden, almost all hospitals are public; they are owned and administered by units of government. In the United States, Australia, Canada, France, and the Federal Republic of Germany, substantial numbers of hospitals are private. They are usually owned and operated by nonprofit organizations, but a few profitmaking hospitals also provide care.

Even in countries with the same types of hospital administration, however, utilization rates were not all alike. The countries with many private hospitals had among the highest and lowest utilization rates. The countries with almost all public hospitals had similar

Table C. Discharge rates and mean length of stays, according to sex: Selected developed countries, selected years 1973-77

Country and year	Discharges per 1,000 population			Mean length of stay in days		
	Males	Females	Females excluding maternity care[1]	Males	Females	Females, excluding maternity care[1]
United States (1977)	140	196	157	7.8	7.0	7.8
Australia (1976-77)	149	218	174	8.0	8.4	8.8
Canada (1975)	135	189	144	11.7	10.7	12.4
Denmark (1974-75)	141	185	144	---	---	---
England and Wales (1975)	83	116	82	12.9	14.4	17.6
Federal Republic of Germany (1977)	137	163	148	16.0	15.7	16.4
Finland (1977)	133	183	143	11.3	11.2	12.6
France[2] (1976)	---	---	---	13.8	14.1	---
Scotland (1976)	110	144	109	13.9	16.9	19.7
Sweden[3] (1973)	135	166	131	10.9	10.4	11.5

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[1] Excluded are females hospitalized for normal deliveries and those with diseases of pregnancy, childbirth, or puerperium as their primary discharge diagnosis: categories 630-678 in the *Manual of International Statistical Classification of Diseases, Injuries, and Causes of Death*, based on the Recommendations of the Eighth Revision Conference, 1965. Estimates were made from partial data for Australia and the Federal Republic of Germany.

[2] Statistics are from public hospitals only and these hospitals average longer mean stays than do private hospitals.

[3] Statistics are from the Uppsala region and Skåne area only. Together these areas have a lower mean length of stay than does Sweden as a whole but their discharge rate is representative of the country as a whole.

NOTE: Long-term hospital patients are included in the statistics from Canada, England and Wales, and Scotland.

SOURCES: (National Center for Health Statistics, 1979; Health Insurance Commission, Australia, 1978; Queensland Office, Australian Bureau of Statistics, 1978; Tasmania Office, Australian Bureau of Statistics, 1978; Western Australian Office, Australian Bureau of Statistics, 1977; Hospital Morbidity Section of Health Division, Statistics Canada, 1978b; National Health Service, Denmark, 1978a; Department of Health and Social Security, Office of Population Censuses and Surveys and Welsh Office, 1978; Federal Office of Statistics, Federal Republic of Germany, 1979; State Statistical Office of Schleswig-Holstein, Federal Republic of Germany, 1978; National Board of Health, Finland, unpublished data; Gascon and Le Roux, unpublished document; Information Services Division of Common Services Agency, Scottish Health Service, 1978a; National Board of Health and Welfare, Sweden, 1976a and 1977).

Table D. Discharge rates and mean length of stays, according to age: Selected developed countries, selected years 1973-77

Country and year	Discharges per 1,000 population			Mean length of stay in days		
	14 years and under	15-64 years	65 years and over	14 years and under	15-64 years	65 years and over
United States (1977)	73	172	374	4.2	6.5	11.1
Australia (1976-77)	126	189	309	4.6	6.7	19.4
Canada (1975)	104	162	339	6.0	8.7	24.9
Denmark (1973-74)	[1]130	[2]159	[3]280	---	---	---
England and Wales (1975)	73	95	164	6.6	9.3	30.7
Federal Republic of Germany[4] (1976)	90	115	189	10.4	12.8	19.7
Finland (1977)	85	147	379	7.6	8.2	19.8
Scotland (1976)	77	125	229	7.5	10.2	34.5
Sweden[5] (1973)	111	134	272	6.4	9.0	16.5

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[1] Statistics include healthy newborns who are excluded from the other countries' statistics.

[2] Statistics are for patients 15-69 years of age.

[3] Statistics are for patients 70 years of age and over.

[4] Statistics are estimated using data from the discharge reporting system in one State, Schleswig-Holstein. This State has a lower discharge rate and lower mean stay than does the country as a whole.

[5] Statistics are from the Uppsala region and Skåne areas only. Together these areas have a lower mean length of stay than does Sweden as a whole, but their discharge rate is representative of the country as a whole.

NOTE: Long-term hospital patients are included in the statistics for Canada, England and Wales, and Scotland.

SOURCES: (National Center for Health Statistics, 1979; Health Insurance Commission, Australia, 1978; Hospital Morbidity Section of Health Division, Statistics Canada, 1978b; National Health Service, Denmark, 1978a; Department of Health and Social Security, Office of Population Censuses and Surveys, and Welsh Office, 1978; State Statistical Office of Schleswig-Holstein, Federal Republic of Germany, 1978; National Board of Health, Finland, unpublished data; Information Services Division of Common Services Agency, Scottish Health Service, 1978a; National Board of Health and Welfare, Sweden, 1976a) mean stays, but they showed considerable variations in discharge rates. In Denmark, Finland, and Sweden, hospitals are owned and operated by local units of government, while in Scotland and England and Wales, hospitals are part of a centrally organized health service. Scotland and England and Wales had much lower discharge rates than other countries with public systems.

In the five countries that have many private hospitals, hospital insurance pays for much of the costs of hospitalization. Canada, France, and the Federal Republic of Germany all have national insurance systems. In Australia and the United States, private insurance covers the hospitalizations of a large part of the population. However, the United States and Australia showed utilization patterns similar to Canada; all three countries had high discharge rates coupled with short mean stays.

Physicians

Physician practices are an important determinant of hospital utilization patterns, but no consistent relationship is apparent between the number of physicians per capita and hospital utilization rates in the 10 countries. The Federal Republic of Germany and Denmark had the largest number of physicians per population. The physician-to-population ratios in the United States, Sweden, and Canada were also comparatively high (table E). These countries had discharge rates ranging from high to intermediate, and mean lengths of stay that varied from the longest to the shortest. The countries with low physician ratios, England and Wales, Australia, and France, also had quite different utilization rates.

The proportion of the physicians in a country who are specialists may be related to hospital utilization rates, although available data do not show a consistent relationship. The complex medical equipment and facilities that are located in hospitals are probably more likely to be used by specialists than by general practitioners. Therefore specialists may admit patients at a higher rate. If the complex technologies allow faster treatment of illnesses, specialists may also keep patients hospitalized for shorter periods of time. Unfortunately, the data available to examine these hypotheses are not ideal because countries define general practitioners and specialists in various ways.

Another aspect of physicians' practices that may have an effect on hospital utilization rates is the degree of separation between physicians providing hospital treatment and those providing ambulatory care to patients. In the United States, Australia, and Canada, the general pattern is for the same physician to treat a patient before, during, and after a hospital stay. In the other seven countries, the physician who treats the patient in the hospital is usually a staff doctor who is not responsible for treatment before or after the hospitalization. It may be that physicians who can follow patients in the hospital are more likely to admit them, and since the physicians can continue to supervise the patients afterwards, they may be less likely to keep patients in the hospital for extended periods. The similarity of hospital utilization patterns in the United States, Australia, and Canada, especially the short mean length of stays, would support this view.

Table E. Physicians per 10,000 population and percent of active physicians who are specialists: Selected developed countries, selected years 1972-78

Country	Physicians			
	Year	*Number per 10,000 population*	*Year*	*Percent who are specialists*
United States	1977	17.9	1977	85
Australia	1972	13.9	1976	48
Canada	1976	17.3	1978	50
Denmark	1976	19.5	1975	61
England and Wales	1974	13.1	1976	54
Federal Republic of Germany	1977	19.9	1977	47
Finland	1977	16.1	1976	50
France	1976	15.3	1976	38
Scotland	1975	16.7	1977	57
Sweden	1976	17.8	1976	88

NOTE: Definitions of specialists vary from country to country.

SOURCES: (National Center for Health Statistics, 1980a; World Health Organization, 1979; Commonwealth Department of Health, Australia, 1977; Department of National Health and Welfare, Canada, 1978; Koch, Toftemark, and Andersen-Rosendal, 1976; Department of Health and Social Security, 1977; Welsh Office, 1978; Federal Office of Statistics, Federal Republic of Germany, unpublished data; National Board of Health, Finland, 1978; Ministry of Health and Social Security, France, 1978; Information Services Division of Common Services Agency, Scottish Health Service, 1978b; National Board of Health and Welfare, Sweden, 1979).

Long-Term Care

The utilization rates of short-term patients are probably affected by the availability of alternative facilities or programs for the treatment of long-term patients. If long-term care is not readily available, long-term patients would be expected to use hospital facilities established for short-term care; this would increase the mean length of stays for such facilities. Appropriate cross-national data to investigate this assumption are difficult to obtain, however. Long-term care is provided within hospital systems in special hospitals and units, in separate systems of medical institutions like nursing homes, and in residential institutions under the authority of social services agencies. Home nursing services and other home support services in some countries also allow patients with chronic medical conditions to remain in their homes rather than in institutions. Comparable data are not available concerning each of these types of care, and the relationships between the types of care are not completely understood. For instance, home nursing care may substitute for nursing home care, but it may be provided to patients with medical conditions different from those who are in nursing homes.

All 10 countries studied here have some long-term hospitals and units. In four of the countries—England and Wales, Scotland, Finland, and Sweden—more than 50 percent of the beds and bed days in the hospital system are accounted for by long-term hospitals and units. England and Wales, Scotland, and Finland do not have separate nursing home systems that provide significant amounts of long-term care, but all four countries have relatively well-developed programs for home nursing and the delivery of other home support services. The mean length of stays for short-term hospital patients in these four countries were about average. The countries with long mean stays—France and the Federal Republic of Germany— have facilities equivalent to nursing homes for treatment of long-term patients. They also have residential institutions in which care is given for some chronically ill persons, but neither has developed widespread programs for home nursing and home support services. However, the same conditions exist in the countries that had the shortest mean length of stays—the United States, Canada, and Australia—so the relationship between long-term care and short-term hospital use requires further study.

Conclusion

The utilization rates of short-term hospital patients differ considerably whether total rates or rates for specific categories of patients are compared. No definitive conclusions about the reasons for the differences can be drawn. Nevertheless, certain findings are suggestive and deserve further study. One such finding is the apparent relationship between centralized public hospital services and low discharge and bed-day rates. Short mean length of stays and high discharge rates seem to characterize the countries in which physicians follow patients when they are hospitalized as well as before and after the hospitalization. Work is currently underway to investigate these relationships.

Even less is known about the results of the differences in hospital utilization than is known about the causes. At present, it is difficult to hypothesize whether people suffer less or live longer if they are hospitalized frequently or stay in the hospital for longer periods. Careful comparisons of hospital utilization in different countries may help in understanding what pattern of hospital use is most effective.

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Length of Hospital Stay[a]

Overview

The average length of time patients remain in short-stay hospitals has been decreasing during the last several years. This trend is the result of many factors connected with the health care system. These factors include: increased utilization of outpatient and day-care facilities, use of home care, technological advances in surgical procedures and treatment methodologies, monitoring by Professional Standards Review Organizations (PSRO's), utilization review, better discharge planning, and limitations placed on the length of hospitalization by third-party payers. This section focuses on the trends that have been evident in recent years, and how the various factors affecting length of stay have applied to a specific disease condition—acute myocardial infarction. The impact of utilization review, particularly as provided by PSRO's, is also discussed.

Recent Trends

The average length of stay[1] for the United States decreased from 8.5 days to 7.4 days in the 10-year period from 1968 to 1978—an overall decrease of about 13 percent (table A). The most pronounced reduction in the average length of stay was from 1968 to 1973, with an 8-percent decrease to 7.8 days. During the same 10-year period, the average length of stay decreased for all age groups. These reductions ranged from 23 percent for people 65 years of age and over to 12 percent for people under 15 years of age.

Part of the decline in length of stay resulted from an increase in multiple hospitalizations for the same individual. In 1968, 14 percent of all people with at least one hospital episode were hospitalized two or more times, compared with 18 percent in 1978. The impact of this increase on length of stay can be estimated by comparing hospital days per discharge (the traditional measure of length of stay) with hospital days per person hospitalized (table B). The reductions in days per person hospitalized were smaller than the reductions in days per discharge in

Table A. Average length of stay for all conditions, according to geographic region and age: United States, 1968, 1973, and 1978

Geographic region and age	Average length of stay			Percent change
	1968	*1973*	*1979*	*1968-78*
	Number of days			
United States...	8.5	7.8	7.4	-12.9
Under 15 years.......	5.0	4.5	4.4	-12.0
15-44 years............	6.1	5.7	5.3	-13.1
45-64 years............	10.0	9.1	8.5	-15.0
65 years and over..	14.2	12.1	11.0	-22.5
Northeast............	9.9	9.0	8.8	-11.1
Under 15 years.......	5.6	5.1	4.9	-12.5
15-44 years............	6.9	6.3	5.7	-17.4
45-64 years............	11.7	10.7	10.1	-13.7
65 years and over..	17.2	14.3	13.7	-19.9
North Central.......	8.8	8.0	7.6	-13.6
Under 15 years.......	5.2	4.5	4.5	-13.5
15-44 years............	6.4	6.0	5.8	-9.4
45-64 years............	10.3	9.4	8.8	-14.6
65 years and over..	14.6	12.4	11.0	-24.7
South....................	7.8	7.3	6.8	-12.8
Under 15 years.......	4.9	4.6	4.2	-14.3
15-44 years............	5.8	5.4	5.0	-13.8
45-64 years............	9.1	8.5	7.9	-13.2
65 years and over..	12.7	11.1	10.0	-21.3
West.....................	7.1	6.4	6.1	-14.1
Under 15 years.......	3.9	3.7	4.2	+7.7
15-44 years............	5.1	4.7	4.7	-7.8
45-64 years............	8.6	7.3	6.7	-22.1
65 years and over..	11.9	10.3	8.8	-25.4

SOURCE: Division of Health Resources Utilization Statistics, National Center for Health Statistics: Data from the National Hospital Discharge Survey.

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[a] Prepared by Andrea Kopstein, National Center for Health Statistics.

[1] The data used for calculating average length of stay excludes newborns but includes deliveries.

Table B. Average length of stay and hospital days per person hospitalized and percent change, according to age: United States, 1968 and 1978

Age	Average length of stay in days		Percent change 1968-78	Hospital days per person with one or more episodes		Percent change 1968-78
	1968	1978		1968	1978	
All ages	9.2	7.9	-14.1	10.4	9.7	-6.7
Under 17 years	5.6	5.2	-7.1	6.4	6.4	0.0
17-44 years	6.6	6.0	-9.1	7.4	6.8	-8.1
45-64 years	11.8	9.2	-22.0	13.7	12.3	-10.2
65 years and over	15.8	11.9	-24.7	19.3	15.6	-19.2

NOTE: The average lengths of stay in table B differ from those in table A because the data are from different surveys. Statistics based on the National Health Interview Survey differ from those reported by the National Hospital Discharge Survey because of differences in population covered, the sources of data, and types of hospitals included.

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

every age group. For children under 17 years of age, no change occurred in days per person hospitalized. For people 45-64 years of age, the reduction in days per person hospitalized was half that of the traditional measure of length of stay. For the other two age groups, the reductions in days per person hospitalized were closer to the reductions in hospital days per discharge.

All four geographic regions showed a downturn in the average length of stays, with the Northeast Region continuing to have the longest stays. The considerable regional variations that have existed in the past have been accentuated over time. For example, in 1968, the average stay ranged from a high of 9.9 days for the Northeast to a low of 7.1 days for the West. By 1978, the average stay in the Northeast was 8.8 days, a reduction of 11 percent, but the average stay in the West was 6.1 days, a decrease of 14 percent.

The trend of decreasing average stays was observed for nearly all age groups in all four geographic regions. The greatest disparities between the Northeast and the West occurred in the two oldest age groups. In 1968, the Northeast had an average stay of 17.2 days for people 65 years of age and over. The length of stay for this age group decreased to 13.7 days by 1978, a reduction of 20 percent. The West had an average stay of 11.9 days for people 65 years of age and over in 1968. This decreased to 8.8 days by 1978, a reduction of 25 percent. For people 45 to 64 years of age, the Northeast had an average stay that went from 11.7 in 1968 to 10.1 in 1978, a decrease of 14 percent. In the same 10-year period for the same age group, the West had an average stay that went from 8.6 days to 6.7 days, a decrease of 22 percent.

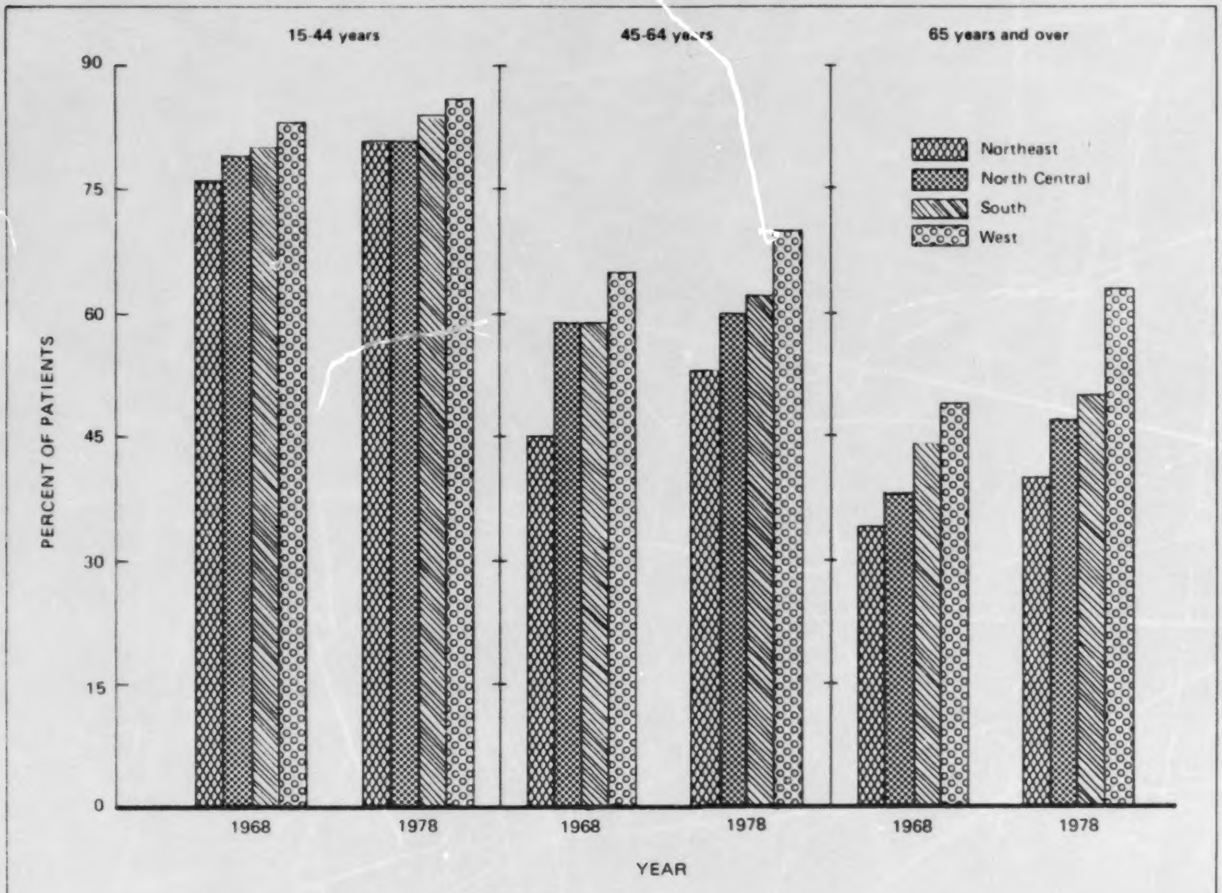
The trend toward shorter stays can be seen even more clearly by examining the length of stay distributions. For example, 67 percent of inpatients stayed in the hospital for 1 week or less in 1968, compared with 70 percent in 1978. This trend was especially marked among the elderly—40 percent had hospital stays of 1 week or less in 1968, compared with 49 percent in 1978. The West had the greatest percentage of short stays throughout the 10-year period and the Northeast had the greatest percentage of longer stays. This regional difference was particularly marked for the two older age groups 45-64 years of age and 65 years of age and over (figure 1). For the oldest age group, the West showed the most pronounced shift toward shorter stays during this period.

Currently, the reasons for these regional variations in length of stay are not completely understood. This problem is a complex one and many area characteristics are presently being studied to explain these differences (Deacon et al., 1977; Wennberg, 1976; and Kincaid, 1979). Factors that may affect regional variation include:

Differences in patient populations.—Diseases or severity of diseases in patients upon admission may vary among the regions. A patient hospitalized for cerebrovascular disease is expected to be hospitalized, on the average, longer than a patient admitted for repair of an uncomplicated hernia. Hypothetically, if one region has a larger proportion of patients with more serious illness when compared to other regions, that region's patient mix should result in a longer average stay.

Differences in availability of resources.—Areas with a relative scarcity of hospital beds may discharge patients sooner if there is pressure to admit new patients. Accessibility of nursing homes and the use of home care in an area may also impact on the levels of hospital utilization.

Differences in financial incentives to providers.—Economic forces, as exemplified by cost review commissions and the extent of coverage by third party payers may affect levels of hospital utilization. The kind of financial incentives existing in Health Maintenance Organizations (HMO's), for example, particularly the prepaid group practice model, reduces both the rate of hospitalization and the aver-



SOURCE: Division of Health Resources Utilization Statistics, National Center for Health Statistics: Data from the National Hospital Discharge Survey.

Figure 1. Patients with hospital length of stay less than or equal to 7 days, according to age and geographic region: United States, 1968 and 1978

age length of stay. The financial risks of HMO's are different from those found with fee-for-service medical care. An HMO receives a yearly capitation payment that puts it at risk for health care costs and provides a strong incentive to avoid overutilization, especially expensive services such as hospitalization (Gaus, Cooper, and Hirschman, 1976). However, the extent to which HMO's contribute to regional variations in utilization is unclear. Currently, certain States have cost review commissions, many of which are prospectively setting rates. Prospective rate setting should result in more efficient utilization of a hospital's facilities since the hospital's budget is set before the provision of services; to remain solvent, the hospital must operate within the limits of its anticipated revenues. Therefore, areas with active cost review commissions should have reduced lengths of stay (Bauer, 1977; Feldstein and Goddeeris, 1977; and Gaus and Hellinger, 1976).

Differences in climate.—Seasonal variations must be studied, particularly for the colder Northeast and North Central regions. Colder climates may influence the frequency or severity of some diseases.

Although regional variation is not well understood at this time, some definitive explanations can be given for the downward trend in average length of stay in the United States. Reasons for the decreases may be better understood by studying changes in the treatment of specific disease conditions. Acute myocardial infarction (heart attack) is chosen for illustration because of its frequency and the large economic benefits of reducing hospitalization for this condition.

Acute Myocardial Infarction

A dramatic decrease in length of stay has occurred for myocardial infarction in recent years. Thirty years ago, the hospital stay for an acute myocardial infarction (AMI) was 6 weeks (Ross, 1978). Table C shows the considerable reductions in length of stays for this condition from 1971 to 1978.

Table C. Average length of stay for acute myocardial infarction[1] (live discharges only) and percent change, according to geographic region and age: United States, 1971 and 1978

Geographic region and age	Average length of stay		Percent change 1971-78
	1971	1978	
	Number of days		
United States	19.2	13.8	-28.1
15-44 years	17.4	11.1	-36.2
45-64 years	18.2	13.3	-26.9
65 years and over	20.9	14.8	-29.2
Northeast	22.0	16.4	-25.5
15-44 years	19.7	12.7	-35.5
45-64 years	21.1	15.6	-26.1
65 years and over	23.5	17.9	-23.8
North Central	20.0	15.4	-23.0
15-44 years	18.5	12.1	-34.6
45-64 years	19.5	15.2	-22.1
65 years and over	20.8	15.9	-23.6
South	16.7	12.4	-25.7
15-44 years	15.5	11.0	-29.0
45-64 years	16.0	11.3	-29.4
65 years and over	17.9	13.8	-22.9
West	17.0	10.3	-39.4
15-44 years	14.9	8.6	-42.3
45-64 years	14.0	10.6	-24.3
65 years and over	20.8	10.4	-50.0

[1] Code number 410, *Eighth Revision International Classification of Diseases, Adapted for Use in the United States.*

SOURCE: Division of Health Resources Utilization Statistics, National Center for Health Statistics: Data from the National Hospital Discharge Survey.

In 1971, the earliest year for which data comparable to 1978 exist, the average length of stay for AMI in the United States was 19.2 days. By 1978, this stay had dropped to 13.8 days, a reduction of 28 percent. In looking at the geographic regions, the Northeast had the longest average lengths of stay for both years and all three age groups. The West had the shortest average hospital stays in 1978 for all three age groups, but the South had the shortest stay for the oldest age group in 1971. All four geographic regions demonstrated a decreasing length of stay for the 8-year period, but the percent reduction was greatest in the West—a decrease of 39 percent.

The large decrease in length of stay for this condition is further demonstrated by examining the percentage of patients staying more than 2 weeks for both 1971 and 1978 (figure 2). In 1971, nearly two-thirds (63 percent) of the AMI patients 45-64 years of age remained in the hospital more than 2 weeks, compared with a figure of only 40 percent in 1978. For those 65 years of age and over, the corresponding proportions decreased from 69 percent to 47 percent. As would be expected from the average stay data, the Northeast had the largest percentages of long stay patients and the West had the smallest. This was the case for both time periods and both age groups.

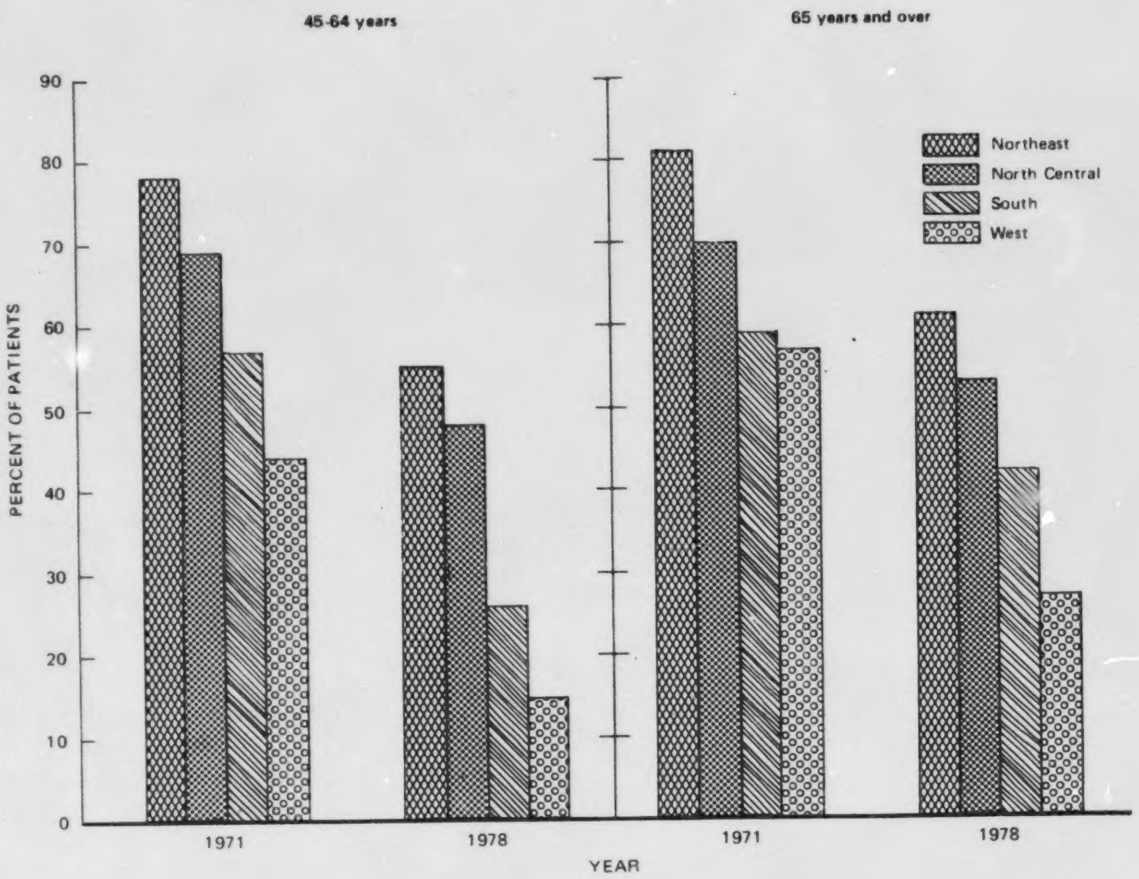
During this 8-year period, all four geographic regions had a decrease in long stay patients for both age groups. However, the decreases for the South and the West were much greater than those observed for the Northeast and North Central Regions. For patients 45-64 years of age, reductions ranged from nearly one-third for the Northeast and North Central to half for the South and two-thirds for the West. For patients 65 years of age and over, the percent of longer stays was cut in half for the West, compared to one-quarter reductions for the other regions.

Many factors have contributed to these large decreases in stay. During the past decade, use of specialized coronary care units for the treatment of AMI's has expanded rapidly. This intensive and expensive therapy uses electrocardiographic monitoring to detect arrhythmias so that prompt treatment may be given. Preventive care is provided with antiarrhythmic medication (Bloom and Peterson, 1973; and McNeer et al., 1978). Although many clinicians justify the use of this costly therapy by a definitely reduced average length of stay and a lower in-hospital case fatality rate, much controversy surrounds the use of coronary care units.

The effectiveness of coronary care units has been tested in some randomized clinical trials, but the number of trials is low since many physicians feel that such tests are unnecessary and unethical (Bloom and Peterson, 1973). A few of these trials have indicated that, in addition to finding up to 50 percent of patients in coronary care units are low-risk patients without myocardial infarctions, coronary care units have not indicated statistically significant advantages over other methods of care (Bloom and Peterson, 1973; and Mather et al., 1971). Despite reductions in the average length of stays, the intensive care provided by these units has greatly increased the cost of hospitalization for suspected and actual myocardial infarctions. With the current emphasis on cost containment, the proliferation and efficacy of coronary care units will receive closer attention in the future.

The rapid escalation of costs associated with AMI treatment has encouraged clinicians to perform studies to determine the optimal duration of hospitalization. Applications of the determinations made may have resulted in shorter, but more effective, hospital stays.

Several studies indicate that a 7-day stay may be adequate for low-risk myocardial infarction patients (McNeer et al., 1978; Gelson et al., 1976; and McNeer et al., 1975). A low-risk patient is one with



SOURCE: Division of Health Resources Utilization Statistics, National Center for Health Statistics: Data from the National Hospital Discharge Survey.

Figure 2. Acute myocardial infarction patients with hospital length of stay greater than 2 weeks, according to age and geographic region: United States, 1971 and 1978

no complications after the fourth day of hospitalization (Ross, 1978; and McNeer et al., 1978). Later complications and death are rare for such patients.

There is also increasing evidence that early mobilization and discharge of AMI patients to hospital-based home care is effective and beneficial (Haber, 1975; and McNeer et al., 1978). Hospital-based home care programs are multidisciplinary and use visiting nurses, physicians, and laboratory technicians, as needed. Cardiac monitoring is accomplished with portable machines. Home care is especially beneficial for elderly patients with this condition. Evidence indicates that the elderly recover faster, adjust more easily, and regain a larger proportion of functional capability if they are discharged from the hospital environment and returned to the familiar environment of home (Haber, 1975).

Another contributing factor to the decreasing length of stay for AMI is the increasing level of public awareness about this condition. Public education in recent years has been directed at making people knowledgeable about the symptoms of heart disease or heart attacks and the risk factors which affect this condition, such as smoking, hypertension, and high cholesterol. This increased awareness may have encouraged people to go to a physician or an emergency room at an earlier stage. AMI victims may also be arriving at emergency care facilities in better condition because of the widespread acceptance, public training in, and use of a technique called cardio-pulmonary-resuscitation (CPR). Evidence of the effect of public awareness on utilization is lacking, however.

Assuming that prompt treatment affects the length of a hospital stay, techniques for diagnosis of myocardial infarctions are being constantly studied and improved. A relatively new technique in nuclear medicine may be helping to detect AMI's earlier (Braunstein and Whelan, 1976). Conventional methods for detecting AMI are electrocardiography (ECG) and determination of enzyme changes. However, ECG changes can be delayed or absent in the presence of an AMI, and enzyme changes are nonspecific. Progress in nuclear medicine has produced a radionucleotide that is used for noninvasive imaging of the heart, and this method may allow for earlier detection of AMI in people complaining of chest pain.

Early mobilization and discharge of patients with myocardial infarction provide several important advantages. Anxiety, depression, and delays in returning to work are common complications of AMI that may be reduced by early discharge. Early ambulation of patients reduces the frequency of thromboembolisms (Miller, 1976; Ross, 1978). Despite previous fears, early mobilization and shorter hospitalizations do not lead to increased incidence of angina, congestive heart failure, aneurysm, acute coronary insufficiency, recurrent myocardial infarction, or death (Hutter, Sidel, and Shine, 1973; McNeer et al., 1978).

Declines have been evident in lengths of hospitalization for many other diagnoses. Table D shows the decline in length of stay for six common conditions. From 1971 to 1978, the greatest reduction in length of stay was observed for cataract. The average stay for malignant neoplasms was also shortened; this represents significant economic benefits since long average stays and expensive treatment are normally associated with this diagnosis. The large reductions in hospital stay for uncomplicated delivery and diabetes mellitus also represent significant decreases in hospital utilization.

Utilization Review

One major factor in reducing the overall length of stay is widespread use of concurrent peer review. This type of review is designed to ensure that individual hospital admissions and continued stays are appropriate and medically necessary. Although some hospitals have performed utilization review on a voluntary basis for a number of years, this effort has intensified since the formation of Professional Standards Review Organizations (PSRO's) as mandated by the Social Security Amendments of 1972 (Public Law 92-603).

Although the PSRO program has had some success in affecting hospital utilization, the full impact of this program is still unclear (Dobson et al., 1978). On the positive side, a recent evaluation of this program (National Center for Health Statistics, 1978) indicated that some individual PSRO's showed decreased utilization (i.e., hospital days of care) when matched to comparison areas. From 1974 to 1977, 96 PSRO's showed an aggregate reduction of 1.5 percent in hospital days of care per 1,000 Medicare enrollees over 93 comparison inactive PSRO areas. PSRO hospitals have also experienced an increase in case-mix severity, which implies a more effective allocation of hospital beds.

Another evaluation of PSRO's stressed the importance of reviewing small area variation when examining changes in average length of stay (Deacon et al., 1979). The longest average length of stay (17.1 days) occurred in a New York PSRO and the shortest stay (7.1 days) occurred in central California. Although this coincides with the stays observed for the geographic regions, a great deal of variation was observed for length of stays among PSRO's within a region. Thus, the characteristics of an area, rather than the geographic location per se, play a large role in determining the length of a hospital stay.

Conclusion

Although shorter hospital stays have multiple benefits, recent emphasis on reducing average stays has been in the interest of cost containment. When discussing the economic benefits of early discharge, however, it should be recognized that the cost of an additional bed day will not be as large as the cost of a

Table D. Average length of stay and percent change, according to selected first listed diagnosis: United States, 1971 and 1978

First listed diagnosis and ICDA code [1]		*Average length of stay*		*Percent change 1971-78*
		1971	*1978*	
		Number of days		
Malignant neoplasms	140-209	14.1	12.4	-12.1
Fracture	800-829	11.7	10.8	-7.7
Cerebrovascular disease	430-438	14.2	13.4	-5.6
Diabetes mellitus	250	11.3	9.7	-14.2
Uncomplicated delivery	650	3.9	3.3	-15.4
Cataract	374	7.1	4.2	-40.8

[1] Diagnostic groupings and code numbers are based on the *Eighth Revision International Classification of Diseases, Adapted for Use in the United States.*

SOURCE: Division of Health Resources Utilization Statistics, National Center for Health Statistics: Data from the National Hospital Discharge Survey.

bed day near the beginning of the stay. This is because of the greater use of diagnostic tests and the more intensive treatment that occurs at the beginning of the hospitalization. In addition, it is not always possible to shorten bed days without increasing the service intensity per day of stay, e.g., physiotherapists or other factors of production, which in turn will raise the cost of a bed day.

Another issue is cost to the hospital. A major portion of hospital costs are fixed and a reduction in total patient days may cause the hospital to raise its prices in order to cover the fixed costs. These increased prices would negate the cost savings resulting from a reduction in length of stay. However, this might only be a short-run effect until hospitals readjusted their scale of operations to meet the new, reduced level of demand. The overall economic impact of shorter hospital stays has yet to be evaluated, since many of the reductions have only occurred during the last decade. However, some of the impacts should be more clearly understood in the near future.

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Trends and Variations in Cesarean Section Delivery[a]

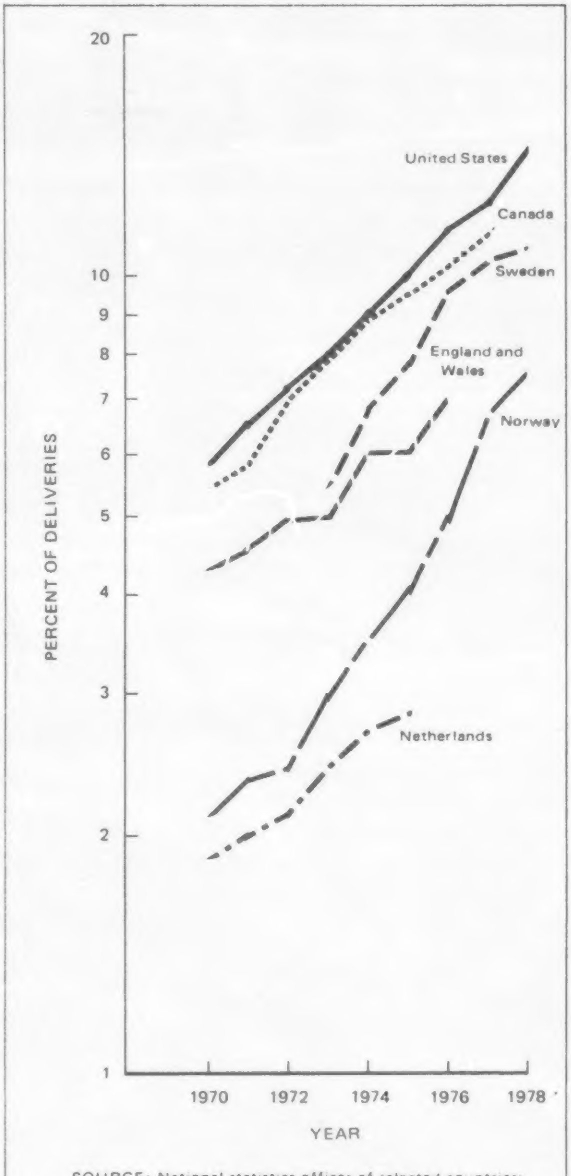
Introduction

Only a decade ago, cesarean section delivery of an infant was a relatively infrequent procedure, usually performed because the mother was unable to deliver vaginally or because the fetus was in serious distress. During recent years, however, there has been a dramatic increase in the number and rate of cesarean section deliveries. This rising trend has occurred at a time when many women are asking their physicians to make their deliveries as "natural" as possible, and so this increase has focused attention on this type of delivery.

This section presents national data on trends and variations in the rate of cesarean sections (C-sections) in U.S. hospitals from 1970 to 1978. Data were obtained from a representative sample of U.S. hospital discharges through the National Hospital Discharge Survey (NHDS), which is conducted by the National Center for Health Statistics. These data refer primarily to live-birth deliveries, but also include some fetal deaths as well. Deliveries occurring outside the hospital are excluded. Only about 1 percent of all live births in 1970 and 1978 occurred outside the hospital. Also excluded are discharges from Federal hospitals, such as military hospitals.

Findings

In 1970, about 195,000 cesarean section deliveries, or about 5.5 percent of all deliveries, were performed in the United States. The number and percent of C-section deliveries rose steadily each year from 1970 through 1978. By 1978, 510,000 deliveries, or 15.2 percent of all deliveries, were by C-section. Figure 1 shows the trends in C-section rates for selected countries from which data were available. The United States and Canada had the



SOURCE: National statistics offices of selected countries: Personal communication.

Figure 1. Percent of deliveries by cesarean section: Selected countries, 1970-78

highest rates, although the increasing trend was evident for all countries. For 1975, C-section rates varied from 3 percent of all deliveries in the Netherlands to 10 percent in the United States and Canada. The average annual percent change in rates for 1970-78 was consistently high for all countries—from 7 percent in England and Wales to 18 percent in Norway.

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Table A shows C-section rates for 1970 and 1978 according to selected maternal characteristics. For both years, C-section rates generally increased with the age of the mother. However, mothers under 20 years of age experienced the most rapid rise in C-section rates over time, from 3.9 in 1970 to 11.8 in 1978. The fact that more than 1 in 10 mothers under 20 years of age had C-section deliveries forebodes rising C-section rates in the future, because many of these young women will experience subsequent deliveries, virtually all of which will be by C-section.

Table A. Cesarean section deliveries, according to selected maternal characteristics: United States, 1970 and 1978

Maternal characteristic	Cesarean section deliveries				Percent change in rate
	1970	1978	1970	1978	1970-78
	Number in thousands		Rate per 100 deliveries		
Total	195	510	5.5	15.2	176.4
Age					
Under 20 years	25	65	3.9	11.8	202.6
20-24 years	61	146	4.9	13.1	167.3
25-29 years	57	172	5.9	16.4	178.0
30-34 years	31	92	7.5	19.3	157.3
35-39 years	15	29	8.2	21.7	164.6
40 years and over	6	5	8.7	19.1	119.5
Color					
White	134	364	5.5	15.6	183.6
All other	31	84	5.4	14.6	170.4
Not stated	30	60	5.8	13.8	...
Marital status					
Married[1]	174	425	5.7	15.5	171.9
Unmarried[2]	19	78	4.5	13.3	195.6
Not stated	2	8	3.2	18.1	...

[1] Includes separated women.
[2] Includes widowed and divorced women.

SOURCE: Division of Health Resources Utilization Statistics, National Center for Health Statistics: Data from the National Hospital Discharge Survey.

Although there was a large proportion of deliveries for women with color not stated, the small differences in rates suggest that C-sections were not associated with color, and they increased at about the same rate for each color group. A greater demarcation was evident for marital status groups, however. Married women continued to have higher C-section rates than unmarried women in 1978, but the increases since 1970 were about the same.

Table B shows C-section rates according to hospital characteristics. Within each geographic region, C-sections increased at about the same pace. The C-section rate was highest in the Northeast Region and lowest in the North Central Region (17.6 and 13.9, respectively).

Table B. Cesarean section deliveries, according to selected hospital characteristics: United States, 1970 and 1978

Hospital characteristic	Cesarean section deliveries				Percent change in rate
	1970	1978	1970	1978	1970-78
	Number in thousands		Rate per 100 deliveries		
Total	195	510	5.5	15.2	176.4
Region					
Northeast	53	119	6.2	17.6	183.9
North Central	52	130	4.7	13.9	195.7
South	61	170	5.8	15.2	162.1
West	30	92	5.7	14.6	156.1
Size					
Less than 100 beds	29	51	4.9	10.1	106.1
100-499 beds	119	317	5.4	15.7	190.7
500 beds or more	47	143	6.6	17.0	157.6
Ownership					
Proprietary	8	14	6.2	16.4	164.5
Government[1]	48	107	5.4	13.1	142.6
Voluntary nonprofit	140	390	5.6	15.8	182.1

[1] State, county, and local hospitals only; Federal hospitals excluded from survey.

SOURCE: Division of Health Resources Utilization Statistics, National Center for Health Statistics: Data from the National Hospital Discharge Survey.

C-section rates increased with hospital size. Rates ranged from 10.1 in hospitals with less than 100 beds to 17.0 in hospitals with 500 beds or more. Although rates increased for all hospital bed-size categories shown in table B, the increase appeared to be smallest for small hospitals and greatest for medium-sized hospitals.

For type of ownership, State, county, and local government hospitals recorded lower C-section rates than proprietary or voluntary nonprofit hospitals in 1978, and they also showed a slightly smaller increase in rates from 1970 to 1978.

Table C compares average length of hospital stay for women who have C-section and all other types of deliveries according to geographic region for 1970 and 1978. In 1978, the average C-section stay was 6.7 days, compared with only 3.2 days for other types of deliveries. A C-section delivery therefore requires about 3.5 days more in the hospital, resulting in a substantial increase in the cost of delivery for women having C-sections. Within each region, for both C-section and other types of deliveries, shorter average hospital stays were observed for 1978 than for 1970. From 1970 to 1978, the average length of stay for C-sections declined from 7.8 days to 6.7 days, or a reduction of about 1 day. For other types of deliveries, the decline was from 3.9 days in 1970 to 3.2 days in 1978, or a decline of a little more than half a day.

Table C. Average length of hospital stay, according to type of delivery and geographic region: United States, 1970 and 1978

Geographic region	Type of delivery: Cesarean section 1970	Cesarean section 1978	All other deliveries 1970	All other deliveries 1978
	Number of days			
United States	7.8	6.7	3.9	3.2
Northeast	8.4	7.5	4.5	3.8
North Central	8.4	7.0	4.3	3.6
South	7.2	6.3	3.5	3.0
West	6.7	5.9	3.2	2.4

SOURCE: Division of Health Resources Utilization Statistics, National Center for Health Statistics: Data from the National Hospital Discharge Survey.

The longest stay for C-sections was in the Northeast (7.5 days), where C-section rates were highest. The length of stay for other types of deliveries was also the longest in the Northeast at 3.8 days. Average lengths of stay were much lower in the West—5.9 days for C-sections and 2.4 days for other types of deliveries. These trends and regional variations in average length of hospital stay for C-sections and all other deliveries are comparable to what has been observed for most other diagnoses.

Unfortunately, only a limited number of maternal and hospital characteristics are available from NHDS data. A much richer source of data, but only for one year's births, is available from the 1972 National Natality Survey (NNS). NNS was based on a 1 in 500 sample of all legitimate live births in the United States, with questionnaires mailed to the mothers, physicians, and hospitals named on certificates of live birth to obtain additional information than was reported through the vital registration system.

From NNS it was found that 7.3 percent of legitimate live births in 1972 were C-section deliveries (Placek, 1977). Higher C-section rates were associated with each of the following maternal characteristics: color other than white, residence in a metropolitan area, high income, having a first or fifth or higher order birth, and 30 years of age or more. Women who delivered by C-section also tended to have more previous fetal losses, underlying medical conditions, complications of pregnancy, more prenatal visits, and more postpartum sterilization operations. Health insurance status had little impact; C-section rates for women with and without health insurance were quite similar.

With respect to infant characteristics, infants with low birth weight (2,500 grams or less) were 66 percent more likely than others to be delivered by C-section. A related finding was that the Apgar scores (an index of infant heart rate, respiratory effort, muscle tone, reflex irritability, and skin color) of infants delivered by C-section were lower than those of other infants. These findings were based on 1972 births when the C-section rate was about half of what it was in 1978. A 1980 NNS is now in progress and should provide an indication of whether the same relationships are still apparent at a time when C-sections are much more common. Since maternal complications, difficult labor, and suspected fetal distress are indications for performing a C-section, it is not possible to use NNS data to separate the effect of the C-section from its causes.

Conclusion

Based on NHDS data, a significant rise in the rate of cesarean section deliveries was observed for the period 1970-78. The uniformity of the increase by maternal and hospital characteristics suggests that a fundamental and widespread change in obstetrical practice has taken place. The international data reinforce this view.

What reasons can be offered to explain the increased tendency for infants to be delivered by cesarean section? Several factors have been studied (Baskett, 1978; Bottoms, Rosen, and Sokol, 1980; Marieskind, 1979). Among the major hypotheses are:

Repeat C-section policy.—If a woman has had a C-section, the nearly universal practice in the United States is to deliver subsequent births by C-sections. Bottoms, Rosen, and Sokol (1980) attribute one-quarter of the overall increase in C-sections to this practice. This practice has been criticized, however, since it has been demonstrated that a substantial proportion of women with previous C-sections can have safe vaginal deliveries (Merrill and Gibbs, 1978).

Technological monitoring of labor.—The increasing use of technology in obstetrics (e.g., electronic fetal monitoring, amniocentesis, and induction of labor) may increase the chances of detecting fetal distress and lead to increased C-sections. Bottoms, Rosen, and Sokol (1980) attribute one-eighth of the increase in C-sections to intervention for fetal distress. Marieskind (1979) suggests that it is not the technology per se that leads to increased C-sections, but rather the interventionist climate that surrounds the training in greater use of technology.

Breech presentation.—There may be a growing reluctance on the part of obstetricians to deliver breech babies (i.e., those presenting buttocks first), since these babies are at higher risk of mortality. Babies that would previously have been delivered breech may now be delivered by C-section. Bottoms, Rosen, and Sokol (1980) attribute one-fifth of the increase in C-sections to breech births.

Difficult labor.—Obstetricians may have changed their criteria for identifying certain labor patterns as abnormal, resulting in an increase in C-sections as an intervention. Bottoms, Rosen, and Sokol (1980) suggest that one-third of the increase in C-section rates can be attributed to the management of difficult labor.

Improved outcome for premature infants.—Since survival rates for low-birth-weight infants have improved in recent years, obstetricians may be more willing to intervene during the early stages of pregnancy if fetal problems arise.

Changing age parity.—Since C-section rates are higher among first births, the increase in the proportion of births that are first births, especially among older women, may be contributing to the overall increase in C-sections. However, if age-parity-specific C-section rates are applied to 1970 and 1978 births, changes in the age-parity distribution of United States births account for less than 5 percent of the overall increase in C-sections.[1]

Fear of malpractice suits.—Obstetricians have pointed to the increasing likelihood of malpractice suits as a factor that disposes them towards C-section delivery if there is any indication of potential for adverse outcome. This explanation, however, does not account for the increases observed in several other countries.

The lack of randomized controlled clinical trials precludes a definitive assessment of the risks and benefits of C-sections deliveries. However, as a major surgical procedure, cesarean section is likely responsible for some increased maternal morbidity and health care costs, and considerable controversy exists over whether there are compensating benefits.

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[1] Since national C-section rates by age and parity were unavailable, California's 1970 rates were used for this calculation (Petitti, Olson, and Williams, 1979). Similar results were obtained when New York State data for earlier time periods were used (Shapiro, Schlesinger, and Nesbitt, 1968).

Section III

Health Care Resources

Physician Supply and Characteristics[a]

Overview

In concert with expansion of the health care sector, all major health professions have exhibited strong growth trends in recent years. Growth in the physician supply has been particularly dramatic.[1]

The number of active physicians (M.D.'s and D.O.'s) increased 34 percent from 1970 to 1979 to 433,600. This represents a two-thirds increase over the 1960 physician supply. Furthermore, the supply has increased more rapidly than the population, raising physician-to-population ratios and, in the aggregate, access to health care services (table 47).

Increases in the number of physicians during the last two decades have resulted in part from the expanding capacity of U.S. medical schools. Since 1960, 46 new medical schools have been established, bringing the total to 138 schools as of 1978. The number of medical school graduates more than doubled from 7,508 to 15,356 during this period (table 51).

Foreign Medical Graduates

A second source of growth has been the entry into the United States of foreign-trained physicians or foreign medical graduates (FMG's). The 30,900 FMG's in the United States in 1963 constituted 11 percent of the physician supply. By 1977, the number had increased to 86,800 or 20 percent of all physicians.

The most common country of origin of FMG's entering the United States has shifted markedly. In 1965, more than one-fourth of physicians immigrating into the United States were from European nations, and about 10 percent were from Asian countries. Recently, the proportion from European countries has dropped to 13 percent, while the proportion of permanent FMG immigrants from Asian countries has risen to 70 percent.

With restrictions on immigration of physicians mandated by the Health Professions Educational Assistance Act of 1976 (Public Law 94-484), a decline in the influx of FMG's can be expected. Physician training data indicate that, for a number of reasons, a decline in FMG's is beginning to occur; 33 percent of graduate training positions (internships and residencies) were filled by FMG's in 1970, compared with 23 percent in 1976 and 18 percent in 1977.

Access

Despite large increases in the physician supply, access to medical care continues to be a matter of national concern. Two recent studies present evidence that the population's access to care is improving (Robert Wood Johnson Foundation, 1978). Per capita visits to physicians and the proportion of the population seeing a physician in a given year have increased between 1963 and 1976. Further, differences in utilization between income and between racial and ethnic groups have diminished.[2] At least 85 percent of the population in both studies indicated they had a regular source of medical care.

This favorable picture of access to medical care in the aggregate may mask localized access problems. Data on physician location in urban and rural counties illustrate the wide discrepancy in availability of physicians. From 1960 to 1970, the number of physicians practicing in rural counties declined 12.4 percent, while the physician supply in urban counties increased 34.8 percent. From 1970 to 1976, instead of declining, the number of physicians in rural counties increased 16.0 percent and the physician-to-population ratio increased 6.7 percent. During the same period, however, the number of physicians in urban counties increased 24.8 percent and the physician-to-population ratio increased 18.1 percent.

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[a] Prepared by Marianne Miller, National Center for Health Services Research.

[1] For a discussion of growth trends for other major health professions, see: *A Report to the President and Congress on the Status of Health Professions Personnel in the United States* (Bureau of Health Manpower, 1980).

[2] See "Use of Ambulatory Care by the Poor and Nonpoor" in this report.

Thus, despite rural increases, a wide discrepancy still exists. In 1976, the physician-to-population ratio in rural counties was 4.8 per 10,000, compared with 17.0 per 10,000 in urban counties.

Shortage Areas

Physician-to-population ratios reflect only one of many dimensions of access to medical care. Also important in assessing access are the health care "needs" of the population in a service area, special utilization patterns associated with population subgroups, and the productivity of physicians and their practices. This broader range of factors is considered in designating health manpower shortage areas under the Health Professions Educational Assistance Act of 1976. These shortage "areas" are primarily geographic units, but may also be designated facilities or population groups. By the end of 1979, a total of more than 1,710 primary medicine shortage areas had been designated. This represents an estimated unserved population of 22 million people, and provides strong evidence of persisting access problems stemming from the geographic maldistribution of health care professionals (table A).

Health manpower shortage areas are designated in connection with three Federal programs: the National Health Service Corps (NHSC), loan cancellation or repayment programs, and scholarship programs. Through these programs, various incentives are created to draw health manpower into shortage areas. Early indications are that approximately one-half of NHSC personnel are extending their tour of duty beyond their required service obligation or remaining in the area on a private basis. The long-term success of Federal programs in inducing health professionals to remain in underserved areas is unknown.

Specialization

The long-term trend in physician specialization has been a decline in general practice and an increase in specialty practice. In 1930, fully 75 percent of physicians were engaged in delivering "primary care," including general practice, general internal medicine, and pediatrics. By 1969, the proportion of primary care physicians had fallen to a low of 38 percent, roughly where it remains today. This development has been an outgrowth of the vast expansion of knowledge and the introduction of new technology in medical fields, the active support of medical research on the part of medical schools, and the prevalence of physician clinical training in the hospital setting, among other factors.

Out of this trend toward increased specialization have grown fears that the availability of primary medical care (i.e., first contact and routine medical treatment and care coordination) may be inadequate, and that the cost of medical care may be inordinately high. To meet the Nation's need for primary medical services, a goal of 50 percent of all medical school graduates entering the primary care specialities has been suggested by a number of groups, including the National Board of Medical Examiners, the National Academy of Sciences, and the U.S. Congress in the Health Professions Educational Assistance Act of 1976.

Table A. Health manpower shortage areas, according to profession: United States, 1979

Profession	*Number of areas*
Primary medicine	1,710
Dentistry	861
Psychiatry	156
Vision care	248
Podiatry	1,404
Pharmacy	139
Veterinary medicine	631

SOURCE: (Division of Manpower Analysis, Bureau of Health Manpower, 1980).

During the last 15 years, the proportion of physicians in broad specialty groupings has remained fairly constant (table B). However, several recent developments, fostered by Federal programs and other initiatives, are likely to result in a relative gain for primary care. The new specialty of family practice has grown rapidly during the 1970's, more than offsetting the decline in general practice. If such growth continues, the number of family practitioners can be expected to increase from 11,000 in 1975 to more than 56,000 by 1990, or from 3 percent of all physicians to 10 percent. The other primary care specialties—general internal medicine and pediatrics—also have exhibited strong growth in recent years. From 1965 to 1977, the proportion of professionally active physicians in general internal medicine and pediatrics combined has increased from 17.3 percent to 23.6 percent. Future increases for primary care are indicated by the number of residencies offered in primary care specialties—41 percent of all positions now, compared with only 26 percent in 1960.

A topic of investigation in several recent studies has been the extent to which primary care services are provided by physician specialists (Aiken et al., 1979). Estimates vary for different specialties and are widely debated because they are based on subjective definitions of primary or principal medical care. The fact that specialists provide some primary care means the shortage of primary care services may be overstated simply by citing an "undersupply" of primary care physicians. However, the full policy significance of this is unclear.

Table. B. Active physicians (M.D.'s) according to specialty: United States, selected years, 1965-77

Specialty	Year 1965	 1969	 1973	 1977
	Percent distribution			
Active physicians	100.0	100.0	100.0	100.0
Primary care[1]	40.7	37.6	38.1	38.8
Other medical specialties	4.8	5.5	5.3	5.5
Surgical specialties	26.2	27.3	28.2	27.8
Other specialties	28.1	29.5	28.3	27.9

[1] Includes general practice, family practice, internal medicine, and pediatrics.

SOURCE: (Bureau of Health Manpower, 1980).

Minorities and Women

The growth in the physician supply has been accompanied by changes in the characteristics of physicians. Women and minority groups still represent small proportions of physicians, yet their ranks have increased proportionately from 1970 to 1977. Women as a proportion of active physicians increased from 7 percent to 9 percent from 1970 to 1977. In 1970, members of racial and ethnic minorities constituted 7 percent of all physicians.

Medical school enrollment figures indicate that both women and minority physicians will play a larger role in delivering medical care in the future. Although enrollment of minorities and women has leveled off since the mid-1970's, the overall growth in enrollment for both groups during the past decade has been substantial. Between academic years 1968-69 and 1978-79, enrollment of minorities in medical schools increased from 3.6 percent to 12.9 percent of total enrollment. Enrollment of women medical students jumped from 8.8 percent to 24.3 percent. More than one-fourth of students entering U.S. medical schools in the last 2 years have been women (Bureau of Health Manpower, 1980). As a result of increased enrollment of women, the number of female physicians is projected to more than double by 1990, reaching nearly 100,000 or more than 16 percent of the total physician supply.

Net Income

Escalating costs of hospital and physician care have long been topics of national concern. Physicians' fees for initial office visits increased 8.6 percent per year between 1970 and 1978 (Glandon and Gaffney, 1979). However, in spite of rising fees, physicians' net income did not keep pace with inflation during this period. Professional expenses increased at a faster rate than gross income, producing a growth in net income of 5.3 percent per year. Compared with the 6.7 percent average annual increase in the Consumer Price Index over this period, physicians' net income grew at a slower rate than overall inflation. Net income growth for physicians in various specialties between 1970 and 1978 ranged from a low of 2.6 percent per year for psychiatry to a high of 6.9 percent per year for anesthesiology (Glandon and Gaffney, 1979).

Future Supply and Requirements

Estimates developed by the Bureau of Health Professions, Health Resources Administration, point to rapid increases in the supply of physicians in coming years. The number of active physicians increased 45 percent from 1960 to 1975. The supply is projected to grow by 37 percent between 1979 and 1990, reaching nearly 600,000 physicians or 23.9 physicians per 10,000 population. Projections of physician requirements are somewhat under the anticipated supply, ranging from 543,000 to 571,000 in 1990, under the assumption that medical care and production characteristics will not change significantly. Allowing for uncertainties about medical care delivery in the future and in the methodology used to forecast physician requirements, projected physician supply and requirements can be viewed as being roughly in balance in 1990. In any case, an overall shortage of physicians is not anticipated in the future.[3]

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[3] For a more detailed discussion of physician requirement projections, see: *A Report to the President and Congress on the Status of Health Professions Personnel in the United States* (Bureau of Health Manpower, 1980).

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Nurse Practitioners and Physician Assistants[a]

Overview

The number of nonphysician health care providers has continued to grow since the first nurse practitioner training program—one for pediatric nurse practitioners—at the University of Colorado and the first physician assistant training program at Duke University were developed in the mid 1960's. The National Center for Health Services Research followed in 1969 with funding for two demonstration projects—one for family nurse practitioners (PRIMEX) and one for physician assistants (MEDEX). Thereafter, two major thrusts of Federal effort in support of physician assistant and nurse practitioner training developed. Provisions were made in the Nurse Training Act of 1971 (Public Law 92-158) for the training of nurse practitioners; the same year, authority was placed in the Comprehensive Health Manpower Training Act (Public Law 92-157) for support of training programs for physician assistants.

Non-federally supported programs, particularly for nurse practitioners, also continued to proliferate. By 1979, 200 nurse practitioner (NP) and 51 physician assistant (PA) programs existed. Of these, however, 60 percent of the NP programs and 90 percent of the PA programs were supported, at least in part, from Federal funds. Approximately 27,000 physician assistants and nurse practitioners have been trained (National Center for Health Statistics, 1980). Assuming an average of 10 graduates from each NP program and 50 graduates from each PA program, an additional 2,000 nurse practitioners and 1,500 physician assistants are projected to be trained each year. This will provide a supply of approximately 38,000 to 40,000 NP's and PA's by 1985 and 53,000 to 55,000 by 1990.

Functions in Practice

The majority of nurse practitioners and physician assistants practice as primary care practitioners, in association with a physician or physicians. This association may be on-site or, in some cases, at a site remote from the physician's location of practice. The PA functions under the general supervision of the physician, while the NP requires supervision for medical management, but not for nursing practice.

The basic functions that physician assistants and nurse practitioners perform are:

- Take medical histories and do physical examinations to define health and medical problems.
- Institute therapeutic regimens within established protocols, and recognize when to refer the patient to a physician or other health care provider.
- Provide counseling to individuals, families, and groups in the area of health promotion and maintenance.

Geographic Distribution

Two factors have an impact on the geographic distribution of NP's and PA's. The first involves the restrictions placed on their services under various professional practice acts in the States, such as supervision requirements and the range of permitted activities including prescribing drugs. The second is whether reimbursement is made for their services by third party insurers, including Medicare and Medicaid.

Some States require direct supervision (i.e., a physician on the premises) of NP's, although the maximum number of NP's a physician may supervise is rarely specified. In the few States where statutes and regulations for NP practice exist, specific procedures that NP's can perform are likely to be identified. In the aggregate, however, supervision requirements for NP's are not as strict as for PA's (Miller, 1978). Nurse Practice Acts are usually nonspecific, other than expanding the role of the nurse to assume functions such as physical examinations.

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[a] Prepared by Jerry L. Weston, Sc.D., National Center for Health Services Research.

Most States require direct supervision for PA's. Nine States set a limit of one PA per physician, while 23 States limit the number of PA's to 2. The procedures that a PA may perform are seldom outlined because the degree of supervision required assumes the physician will delegate appropriate tasks. In States where physician supervision legally can be indirect (i.e., telephone communications, chart review, periodic physician visits, etc.), supervision requirements need not seriously restrict the practice of NP's and PA's.

Both NP's and PA's are prohibited from prescribing drugs in the majority of States. Even where States have legislation permitting these providers to prescribe, prohibition contained in State pharmacy statutes may override legislation (Miller, 1978). Prohibitions against prescribing limit the extent to which NP's and PA's can provide primary care services, particularly in settings remote from the physician.

Traditionally, neither public nor private third party payers have reimbursed for medical services provided by NP's or PA's unless the physicians were on-site and services were billed by them. The problem of off-site supervision (remote practice settings) and reimbursement for NP's and PA's was addressed in 1977 by Public Law 95-210, which amended Titles XVIII and XIX of the Social Security Act. This legislation provides for Medicare and Medicaid reimbursement for NP or PA services in certified clinics that lack a full-time physician. To be certified, a clinic must demonstrate that it is located in an area designated by the U.S. Bureau of the Census as rural and by the Secretary of the Department of Health and Human Services as having a shortage of primary care services.

This benchmark legislation is limited in several respects, however:

- Clinics can be certified only if the State regulations are met, such as provisions on NP or PA remote practices and the ratio of physicians to NP's and PA's.
- Clinics are reimbursed for "reasonable cost" of NP or PA services rather than "prevailing charge" for the same services provided by a physician.
- Nurse-midwives are not included as primary care providers and thus clinics staffed solely by them are not eligible for reimbursement.
- The paperwork for substantiating claims is time consuming.
- Urban areas in need of primary care services are restricted to experimental demonstration projects.

Under this legislation, 344 clinics had been certified as of September 1979 (Health Care Financing Administration, 1979). Preliminary evidence indicates that clinics are eschewing their participation because of the paperwork and the cost basis for reimbursement.

Future Considerations

Two major developments in the supply of physician manpower may affect the utilization of nurse practitioners and physician assistants in the future. First is the large number of U.S. medical graduates predicted by 1990. Some preliminary evidence suggests that as this supply increases, these graduates are locating in less urban areas. Practice settings previously considered for NP's and PA's may be usurped by physicians. An additional factor in the increasing supply of physicians is demonstrated by the current dilemma in pediatrics. The acceptance of pediatric nurse practitioners was overwhelming in the 1960's during the "baby boom" era, however, as the birth rate reaches zero population growth and the number of pediatricians increases, there appears to be a decrease in pediatricians' acceptance of these nurse practitioners (American Academy of Pediatrics, 1977).

Second, given the constraints placed on foreign medical graduates by the Health Professions Educational Assistance Act of 1976 (Public Law 94-484), those hospitals whose residency programs would suffer the most from these constraints are considering, among their options, the utilization of NP's and PA's in patient care as a short-term solution (Cohodes et al., 1980). A principal concern of these hospitals is the productivity of NP's and PA's. It would require approximately 1.5 to 2 NP's or PA's for each fulltime equivalent physician.

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Community Hospitals: Trends and Regional Differences[a]

Introduction

Community hospitals are defined as all non-Federal short-term general and other special hospitals available to the public, excluding the hospital units of long-term institutions. This section presents data that are based on the annual surveys of hospitals conducted by the American Hospital Association.[1] Because hospital units of long-term care institutions were included in the community hospital category prior to 1972, this discussion focuses on data for 1972-78 (American Hospital Association, 1973-79).

Trends in Community Hospitals and Services

The number of community hospitals, which accounts for more than 98 percent of all short-term hospitals in the United States, rose from 5,746 to 5,851 during 1972-78 (table A). Despite this slight increase in the number of hospitals—less than 2 percent—the numbers of beds, admissions, average daily census, and outpatient visits all increased substantially for these hospitals, while the occupancy rate and average length of stay decreased slightly. Community hospital beds rose by 11 percent to 975,000. Taking into account the population growth, the number of beds per 1,000 population rose by 6 percent, from 4.21 to 4.47. Hospital admissions increased by 12 percent to nearly 34.5 million. Average daily census increased 8 percent to 718,000. On the other hand, the occupancy rate declined from 75.4 percent to 73.6 percent of beds occupied and the average length of stay declined from 7.9 days to 7.6 days.

The number of outpatient visits in 1978 was more than 201.9 million, about one-quarter more than in 1972. However, this apparent increase may have been affected by a change in the 1977 and 1978 annual surveys by the American Hospital Association that requested hospitals to distinguish outpatient "occasions" of service from outpatient "visits". An occasion of service is counted whenever a test, examination, treatment, or procedure is given to an outpatient. A visit is counted as each appearance by an outpatient to a unit of the hospital, and may include one or more occasions of service. The distinction between visit and occasion of service in survey categories may result in some variation in the outpatient data, and this should be taken into account when comparing outpatient data for different periods.

Community hospitals can be classified by type of ownership into private nonprofit, proprietary, and government-owned. In 1978, the ownership distribution was 57, 13, and 30 percent of community hospitals, respectively. However, private nonprofit hospitals accounted for 70 percent of the beds and services, proprietary hospitals accounted for 8 percent, and government-owned hospitals accounted for about 22 percent.

A closer look at the changes in hospital beds and services by type of ownership reveals that proprietary hospitals had a 42-percent increase in beds, and a one-third increase in admissions and average daily census during 1972-78—the highest percent increases in these inpatient services among all types of ownership (table B). However, outpatient visits to proprietary hospitals increased by only 14 percent—the lowest percent increase among all types of ownership. On the other hand, private nonprofit hospitals had about one-tenth increases in beds, admissions, and average daily census. A 27-percent increase in outpatient services for private nonprofit hospitals was the highest among all types of ownership. State and local government-owned hospitals showed lower rates of growth. Their average daily census remained around 146,000. Their beds and admissions increased

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[1] The data used in this section differ slightly from the data presented in detailed tables 53-57, because the latter are based on information from the Master Facility Inventory which is explained in Appendix I.

Table A. Community hospitals, beds, and services, and percent change: United States, selected years 1972-78

Year	Number of hospitals	Number of beds in thousands	Occupancy rate[1]	Admissions	Average daily census	Outpatient visits	Average length of stay in days
				Number in thousands			
1972	5,746	879	75.4	30,709	663	162,668	7.9
1973	5,789	898	75.7	31,671	680	173,068	7.8
1974	5,875	926	75.6	32,866	700	188,940	7.8
1975	5,875	942	75.0	33,435	706	190,672	7.7
1976	5,857	956	74.6	33,979	713	201,247	7.7
1977	5,881	969	73.8	34,273	715	198,708	7.6
1978	5,851	975	73.6	34,506	718	201,931	7.6
			Percent change				
1972-78	1.8	10.9	-2.4	12.4	8.3	24.1	-3.8
1977-78	-0.5	0.6	-0.3	0.7	0.4	1.6	-

[1] Percent of beds occupied.

SOURCE: (American Hospital Association, 1973-79).

by only 3 and 8 percent, respectively, and their occupancy rate and average length of stay declined by less than 3 and 8 percent, respectively.

There were significant changes in the distribution of community hospitals and hospital beds by hospital bed size. Generally, the larger the hospitals, the higher were their rates of increase. This was true for both major bed size categories (i.e., small, medium, and large) and the further breakdowns by bed size within these categories (table C). The most significant increase occurred in the number of large hospitals (400 beds or more) which increased 20 percent from 464 to 557 during 1972-78. Medium-sized hospitals (100-399 beds) increased 12 percent. In contrast, the number of small hospitals (less than 100 beds) declined 8 percent.

Small hospitals had 147,000 beds, which accounted for 15 percent of community hospital beds in 1978 (see table D). Large hospitals had 324,000 beds, about one-third of all hospital beds, and medium hospitals had 504,000 beds, a little more than half of all hospital beds. In terms of percent changes, the number of beds in small hospitals decreased by 6 percent. For large hospitals, beds increased by about one-fifth.

Regional Differences

As noted earlier, the number of hospitals in the United States increased about 2 percent from 1972 to 1978, however, regional differences were evident (tables E and F). While hospital numbers in the New England, Middle Atlantic, and Pacific Divisions decreased by less than 4 percent, other divisions had increases ranging from 2 percent for East North Central to 8 percent for South Atlantic.

From 1972 to 1978, the number of hospital beds in the United States increased 11 percent from 878,600 to 975,400. Unlike the regional variations evident in the number of hospitals, with some divisions increasing and others decreasing, all of the divisions showed increases in the number of beds, ranging from a 2-percent increase in the Middle Atlantic Division to a 21-percent increase in the South Atlantic Division. These increases are in line with the previous findings that hospitals tended to expand their bed size, and that the numbers of hospitals and hospital beds increased in favor of large hospitals during the period under study.

In measuring the adequacy of hospital facilities within a division, it is more meaningful to examine the bed-to-population ratios than the number of hospitals or hospital beds alone. The ratio provides a standard measure of hospital facilities relative to population. In 1978, the bed-to-population ratios of the Central Divisions ranked the highest, with West North Central being first (5.82 beds per 1,000 population), followed by East South Central (4.86) and East North Central (4.69). Pacific (3.57) and Mountain (3.83) were the only divisions with less than 4 beds per 1,000 population. Other divisions fell in between.

For the United States, the number of beds per 1,000 population increased 6 percent from 4.21 to 4.47 during 1972-78. The bed-to-population ratios of the divisions showed increases ranging from 1 percent for New England to 14 percent for East South Central. The ratios for the Mountain and Pacific Divisions decreased by nearly 3 percent. For some divisions, the bed-to-population ratios increased and then decreased with peak values sometime during 1974-76. However, because some changes were slight and the observation time period was short, the peak values may not be significant.

The Southern Divisions expanded the most in terms of the numbers of hospitals, beds, and bed-to-population ratios. For the New England and Middle

Table B. Distribution of community hospitals, beds, and services, according to type of ownership: United States, 1972 and 1978

Year and type of ownership	Number of hospitals	Number of beds in thousands	Occupancy rate[1]	Admissions	Average daily census	Outpatient visits	Average length of stay in days
1972				Number in thousands			
All ownerships	5,746	879	75.4	30,709	663	162,668	7.9
Private nonprofit	3,301	617	77.5	21,862	478	111,317	8.0
Proprietary	738	57	68.7	2,161	39	7,842	6.6
State-local government	1,707	205	71.0	6,686	146	43,510	8.0
1978							
All ownerships	5,851	975	73.6	34,506	718	201,931	7.6
Private nonprofit	3,339	683	76.2	24,428	520	141,862	7.8
Proprietary	732	81	63.8	2,880	52	8,911	6.5
State-local government	1,780	211	69.2	7,198	146	51,157	7.4

[1] Percent of beds occupied.

SOURCE: (American Hospital Association, 1973-79).

Table C. Distribution of community hospitals and percent change, according to hospital bed size: United States, selected years 1972-78

Year	Total	Hospital bed size							
		Small			Medium			Large	
		6-24	25-49	50-99	100-199	200-299	300-399	400-499	500 or more
		Number of hospitals							
1972	5,746	330	1,223	1,483	1,254	624	368	205	259
1977	5,881	283	1,108	1,442	1,401	713	380	243	311
1978	5,851	268	1,075	1,444	1,398	717	392	240	317
		Percent change							
1972-78	1.8	-18.8	-12.1	-2.6	11.5	14.9	6.5	17.1	22.4
1977-78	0.5	-5.3	-3.0	0.1	-0.2	0.6	3.2	-1.2	1.9

SOURCE: (American Hospital Association, 1973-79).

Table D. Distribution of community hospital beds and percent change, according to hospital bed size: United States, selected years 1972-78

Year	Total	Hospital bed size							
		Small			Medium			Large	
		6-24	25-49	50-99	100-199	200-299	300-399	400-499	500 or more
		Number of beds in thousands							
1972	879	6	44	106	176	150	125	89	182
1977	969	5	40	104	196	173	129	108	214
1978	975	5	39	103	197	174	133	106	218
		Percent change							
1972-78	11.0	-16.5	-11.6	-2.1	11.9	15.7	6.4	18.9	19.6
1977-78	0.6	-5.3	-2.5	-0.4	0.2	5.9	3.1	-1.4	1.9

SOURCE: (American Hospital Association, 1973-79).

Table E. Community hospitals, beds, and services, according to geographic division: United States, 1978

Geographic division	Number of hospitals	Number of beds in thousands	Beds per 1,000 population[1]	Occupancy rate[2]	Average length of stay in days
United States	5,851	975.4	4.47	73.6	7.6
New England	259	51.0	4.16	77.6	8.1
Middle Atlantic	636	167.9	4.56	81.7	9.1
South Atlantic	809	149.6	4.33	73.7	7.4
East North Central	910	193.2	4.69	75.5	7.9
East South Central	484	68.0	4.86	74.2	7.0
West North Central	799	99.0	5.82	69.7	8.1
West South Central	853	100.8	4.57	68.0	6.5
Mountain	362	39.4	3.83	67.6	6.5
Pacific	739	106.5	3.57	66.5	6.4

[1] Ratios are based on 1978 preliminary estimates of the population.

[2] Percent of beds occupied.

SOURCE: (American Hospital Association, 1973-79; U.S. Bureau of the Census, 1979)

Table F. Percent change in community hospitals, beds, and services, according to geographic division: United States, 1972-78

Geographic division	Number of hospitals	Number of beds	Beds per 1,000 population[1]	Occupancy rate[2]	Average length of stay
			Percent change		
United States	1.8	11.0	6.2	-2.4	-3.8
New England	-3.7	2.4	1.2	0.8	-
Middle Atlantic	-3.0	2.3	4.6	0.9	-2.2
South Atlantic	8.2	20.5	11.3	-4.5	-2.6
East North Central	1.9	10.0	9.1	-2.7	-4.8
East South Central	3.6	21.1	14.1	-4.3	-4.1
West North Central	2.3	11.2	8.8	-1.6	-2.6
West South Central	3.4	18.6	7.5	-4.9	-7.1
Mountain	1.4	12.6	-2.8	-2.0	-1.5
Pacific	-1.5	6.9	-2.5	-1.2	-3.0

[1] Ratios are based on 1978 preliminary estimates of the population.

[2] Percent of beds occupied.

SOURCES: (American Hospital Association, 1973-79; U.S. Bureau of the Census, 1979)

Atlantic Divisions, the numbers of beds and bed-to-population ratios were up only slightly, while the numbers of hospitals decreased. For the Mountain Division, the numbers of hospitals and beds increased, but not as rapidly as their population, and this resulted in a lower bed-to-population ratio in 1978 than in 1972. For the Pacific Division, a relatively small expansion of hospital beds with a reduction in the number of hospitals and a relatively large population growth resulted in a reduction of nearly 3 percent in its bed-to-population ratio.

The occupancy rate of hospitals in the United States was 73.6 percent in 1978, compared with 75.4 percent in 1972. For the divisions, the rate ranged from 67 percent for Pacific to 82 percent for Middle Atlantic. The pattern of occupancy rates across the divisions was somewhat different from that of the bed-to-population ratios. While the Pacific and Mountain Divisions had the lowest occupancy rates as well as bed-to-population ratios, the Eastern Divisions rather than the Southern Divisions had the highest occupancy rates.

With the exception of the New England and Middle Atlantic Divisions which had slight increases, all of the divisions experienced decreases in the occupancy rate, ranging from 1 to 5 percent. Similar to the bed-to-population ratios, some divisions had peak occupancy rates sometime during 1974-76. Again, because some changes were slight and the observation time period was short, the peak values may not be significant.

The average length of stay in the United States was 7.6 days in 1978, compared with 7.9 days in 1972. A slight reduction in lengths of stay occurred in all divisions, ranging from 2 percent for the Mountain Division to 8 percent for the West South

Central Division. In 1978, lengths of stay ranged from 6.4 days for the Pacific Division to 9.1 days for the Middle Atlantic Division. Ranking among the divisions was similar to that for occupancy rates, although the West North Central Division which ranked sixth in occupancy rate, ranked second in average length of stay.

Health Planning Goals

The National Guidelines for Health Planning prescribe fewer than 4.0 non-Federal, short-term hospital beds per 1,000 population and at least an 80-percent occupancy rate for health service areas, except under extraordinary circumstances (Health Resources Administration, 1978). When the number of beds per 1,000 population is larger than 4.0 or the occupancy rate is less than 80 percent, excess bed capacity contributes to the high cost of hospital care with little or no health benefit. Inappropriate use of beds can also increase the hospital charges to patients and push up health care costs.

The bed-to-population ratios and occupancy rates of the United States in 1978 were farther away from the guidelines than in 1972. The bed-to-population ratio was up from 4.21 to 4.47 per 1,000 population, while the occupancy rate was down from 75.4 to 73.6 percent. All the divisions experienced an increase in their bed-to-population ratios, except the Pacific and Mountain Divisions which were the only ones in 1978 having ratios of less than 4 beds per 1,000 population (3.6 and 3.8, respectively). The South Atlantic Division had a ratio of 3.9 in 1972, but it increased to 4.3 in 1978. According to the guidelines, programs should be designed and implemented to reduce the bed-to-population ratios.

As to the occupancy rates, all the divisions were below 80 percent in 1972, except the Middle Atlantic Division with 81 percent. By 1978, all the divisions declined slightly while the Middle Atlantic Division rose slightly. The result was that only the Middle Atlantic Division had an occupancy rate above the 80-percent goal, while the other divisions were even farther away from the guidelines in 1978 than they were in 1972.

To contain hospital care costs, appropriate utilization of existing bed facilities, constraints on hospital bed capacity growth, and improved planning and management are needed. Increased occupancy rates should not be achieved through unnecessary hospital admissions or increases in lengths of stay.

Summary

On the average, hospitals tended to expand their bed sizes, and the increase was in favor of larger hospitals. From 1972 to 1978, the total number of community hospitals increased only slightly, but the numbers of beds, admissions, average daily census, and outpatient visits all increased substantially. Proprietary hospitals had the highest percent increase in inpatient services, measured by the numbers of beds, admissions, and average daily census, but they had the lowest percent increase in outpatient services. Private nonprofit hospitals had the highest percent increase in outpatient services among all types of ownership.

The expansion of larger hospitals and bed size in the South led to higher rates of increase in bed-to-population ratios. For other geographic divisions, increasing numbers of beds and slightly decreasing lengths of stay resulted in a slight reduction in the occupancy rates, except in the New England and Middle Atlantic Divisions. From 1972 to 1978, the bed-to-population ratios rose from 4.21 to 4.47 beds per 1,000 population in the United States, the occupancy rate declined from 75.4 to 73.6 percent, and the average length of stay declined from 7.9 days to 7.6 days. The bed-to-population ratios for the divisions ranged from 3.57 per 1,000 population for Pacific to 5.82 for West North Central. The occupancy rate ranged from 67 percent for Pacific to 82 percent for Middle Atlantic. The average length of stay ranged from 6.4 days for Pacific to 9.1 days for Middle Atlantic. Generally, the Central Divisions had the highest bed-to-population ratios and the Eastern Divisions had the highest occupancy rates and lengths of stay. The Pacific and Mountain Divisions ranked the lowest in terms of the bed-to-population ratio, occupancy rate, and length of stay.

From the standpoint of the national health planning goals, only the Pacific and Mountain Divisions had fewer than 4 beds per 1,000 population, and only the Middle Atlantic Division had an occupancy rate higher than 80 percent. Some divisions (e.g., West South Central) showed peak values in bed-to-population ratios during 1974-76, followed by a decline which may continue to 4 beds per 1,000 population or lower in the future. However, because of the slight changes and short observation period, it would be premature to project a continuation of this declining trend. Similarly, no favorable trend toward planning goals can be projected for the occupancy rate. Differences in the number of beds, occupancy rates, and lengths of stay across the divisions indicate a continuing uneven distribution of hospital resources and services relative to population needs, and relatively less efficient use of hospital resources in certain geographic regions of the country.

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Nursing Homes: Public Expenditures and Public Policy[a]

Overview

The annual growth rate in expenditures for nursing home care for 1967-77, which averaged more than 20 percent per year, was principally fueled by inflation (14.88 percent) and to a lesser extent by changes in the number of residents being served (5.44 percent) (Worthington, 1975; Gibson, 1979; National Center for Health Statistics, 1972a and 1979). The latter figure was affected by a combination of two factors as follows:

- 3.85 percent resulted from increases in the size of the at-risk population, i.e., people over 65 years of age (U.S. Bureau of the Census, 1974);
- 1.59 percent was because of higher rates of utilization among those at risk.[1]

In short, inflation, a greater number of elderly people, and an increased tendency among the elderly to use nursing homes raised expenditures for nursing homes by rates of more than 100 percent every 5 years during most of the last two decades. In 1977, more than 1.1 million people 65 years of age and over resided in 18,900 nursing homes. These residents accounted for 4.8 percent of the U.S. population 65 years of age and over (National Center for Health Statistics, 1979).

In 1978, 46 percent of the financial support for nursing home patients came from Medicaid, the Federal and State cost-sharing program for the poor (Gibson, 1979). Most of the remainder came from the patients themselves. Medicare, the federally supported health insurance program for the aged, pays for little nursing home care. It covers a maximum of 100 days of care per episode, only if the level of nursing home care required is skilled care. A patient co-payment of 20 percent of the charges is also required after 20 days of a stay. Furthermore, the skilled care admission must be preceded by a 3-day hospital stay necessitated by the same problem. Combined, these criteria usually ensure that Medicare nursing home coverage is limited to post acute rehabilitative care rather than the maintenance care that many nursing home residents need. Consequently, in 1978, Medicare provided only 4.7 percent of nursing home support (Gibson, 1979).

Figures for 1977, the latest reporting period, show that 39 percent of all Medicaid expenditures were devoted to nursing home care (Health Care Financing Administration, 1979a). Since a substantial portion of Medicaid dollars come from the States, it is understandable why the States have acted to try to slow the dollar outflow.

Within the broad discretion granted them by the Medicaid legislation, the States have attacked the two principal components of increasing costs—reimbursement rates and utilization rates—in the following ways:

- They restrict reimbursement to resist increased outlays.
- They use utilization review and prescreening programs to keep people from entering nursing homes and force the discharge of those who should not be there.
- They restrict bed growth through requiring certificate-of-need reviews before new beds can be built.
- They promote and fund new settings for long-term care, many of which are viewed as ways of reducing the increasing rate of use of nursing homes by the at-risk population.

Restricting Reimbursement

Despite acknowledged access problems for some patients, the States have been reluctant to raise reimbursement rates. Nonetheless, reimbursement rates in Medicaid homes have continued to rise even faster than rates in the rest of the health care sector (National Center for Health Statistics, 1972 and 1979; Economic Report of the President, 1979).

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[1] Derived from application of 1969 utilization rates to 1977 population statistics by age category to estimate what utilization rates would have been in 1977 if 1969 rates had prevailed.

One factor that may have contributed to increased rates despite resistance from the States was a 1972 Federal mandate which required that the States ensure their reimbursement rates were not arbitrarily set. Rather, the Federal law required that rates must be reasonably related to the costs of rendering care (1972 Amendments to the U.S. Social Security Act, Sec. 249). The intent of this law was to avoid possible adverse effects on quality of care because of low rates.

Effectiveness in cost containment exacts a price in other ways, however. Skimming—the practice of picking and choosing among applicants to select those easiest to care for—is apparently one unwanted effect of low rates. Though many nursing home administrators deny the existence of this practice, recent research suggests that the potential is great, and some evidence shows that it does happen (Governor's Commission to Study Problems in Nursing Homes, 1973; Willemain, 1977; Scanlon, 1980). Facing a sellers' market because of bed shortages, some administrators avoid patients who would require care beyond the ability of the home to render it without additional, expensive staff. Additional staff might drive the home's average daily cost above the cap or flat rate, or reduce profit.

The result is that many Medicaid-covered patients, especially those who require more than average care, have a difficult time securing admission to a nursing home. Often, such patients are inappropriately kept in expensive hospital beds while awaiting nursing home placement (U.S. General Accounting Office, 1979; National Capital Medical Foundation, 1979).

Utilization Review

Whether the States' utilization review efforts have been successful in keeping out of nursing homes people who would be better off somewhere else is a matter of considerable debate and speculation. Empirical studies have yielded mixed results. Estimates of the proportion of patients who are inappropriately placed in nursing homes range from 6 to 76 percent of those now in nursing homes (Congressional Budget Office, 1977). This range demonstrates the difficulty in making reliable estimates of the problem's magnitude. Whether or not someone is inappropriately placed in a nursing home depends partially upon availability of alternative sources of care and the efficacy and cost effectiveness of those alternatives. Also important to note is whether or not the placement is a transitional one only until better arrangements can be made. Some research suggests that placement may also be influenced by the patient's choice (Noelker and Beckman, 1979).

Nonetheless, few ideas have more current appeal than an aggressive program of nursing home prescreening. Virginia has adopted such a program, and it has received considerable attention from other States (Carnes and Cook, 1977). Federal regulations already require a treatment authorization prior to admission (Code of Federal Regulations, Sec. 405). However, the emphasis of Virginia-style programs is on whether an alternative setting would be more appropriate, not just on certification that the patient's condition meets minimal admission standards.

Federal regulations also require the States to review the appropriateness of continued stays in nursing homes (Code of Federal Regulations, Sec. 405). Patients admitted to skilled nursing facilities must be reviewed within 30 days after admission (with certain exceptions) and at least every 30 days for the first 90 days, followed by a review at least every 90 days. Requirements for intermediate care facilities are less stringent.

In practice, however, while the States have had substantial success in forcing reclassification of patients from skilled to intermediate levels of care, few States have been willing to take the additional step of trying to force out of the nursing home a patient who is no longer qualified to remain institutionalized. Typically, if the stay has been of 90 days or more, the assumption is that the patient no longer has the community resources—home, furniture, or family support—to return to the community.

Certificate of Need

By 1979, almost all of the States had adopted a certificate-of-need law covering nursing homes (Feder and Scanlon, 1980). Though some States began on their own, the impetus to broad adoption came from the National Health Planning and Resources Development Act of 1974, which required such reviews. That law specified that State laws must require certificate-of-need reviews for construction expenditures of more than $150,000 and any change in bed capacity or services. Without such certification, beds cannot be licensed, civil or criminal penalties may be imposed, and construction may be halted by the State.

These laws can be effectively used by the States to set bed growth limits. A recent survey showed that of 84,692 bed requests officially made to a group of Health Systems Agencies (comprising 81 percent of all such agencies) 23 percent of the requests were turned down. An additional large number of proposed beds were never actually requested, presumably because of the prospect of being turned down (American Health Planning Association, 1979; Feder and Scanlon, 1980). However, sometimes these limits can produce an inadequate supply of beds in terms of both need and demand (Scanlon, 1980).

New Settings for Long-Term Care

With the 1972 amendments to the U.S. Social Security Act (which covers Medicare and Medicaid), Congress authorized the then Department of Health, Education, and Welfare, to experiment with care settings other than nursing homes to see if they would provide more effective or less costly alternatives for some patients.

Several major experiments have been funded, several more are planned, and one has been completed. Findings from the completed study are not encouraging (Weissert et al., 1980; Weissert et. al., to be published).

The study tested day care and homemaker services for the chronically ill, using a randomized experimental design. Patients in portions of six cities were offered one or the other service as an additional option under their Medicare program. Another group of patients did not receive the new service but continued to receive their Medicare-covered and, if poor, Medicaid-covered services. Who received the service and who did not was decided by random choice once a pool of eligible beneficiaries had been selected. This ensured that those who received the new service were similar or identical to those who did not. After 1 year, the groups were compared. Day care showed no significant contribution to patient functional abilities (physical or mental), patient contentment, or social activity level. Unexpectedly, institutionalization was not reduced by the new service. Indeed, institutionalization rates in the control group showed that most of the patients who used the new service were probably using it as an add-on to existing services since they were not the type of patient who would go into a nursing home. Homemaker services similarly provided few benefits and were used as an add-on. Homemaker services did raise patient contentment by a small amount and may have indirectly extended life for a few patients. Again unexpectedly, homemaker patients experienced increased use of hospitals, and it may have been these higher rates of hospitalization which kept patients alive longer. Each of the new services raised costs considerably—71 percent for day care and 60 percent for homemaker services when compared to costs for the group which did not get the new services.[2]

These results suggest that it may be difficult to design new services that will actually function as alternatives to institutional care rather than as simple expansions of benefits. Yet research in the field has barely begun, and new configurations of services are currently being designed that may provide better flexibility to patients, thereby increasing the likelihood that patients will use only what they need. This could keep costs down and increase the probability that the right types of patients will be served.

Particularly promising is the effort by the Department of Health and Human Services to test the effects of providing a case management function to elderly patients living in the community. This assumption is that social and health care specialists will be able to assess an elderly person's health and social needs, and then design and implement a plan to ensure those needs are met. If successful, some patients who are now going into nursing homes because they need certain unavailable services might find their needs met by arrangements made by the case manager (Federal Register, 1979).

Another group of alternatives are institutions sometimes called board and care homes or personal care homes. At present, there may be more than 200,000 beds in this type of home certified by the States. In addition, many housing units known as congregate living facilities have been funded by Department of Housing and Urban Development grants as well as private enterprise. Exactly how some of these differ from the lowest level of nursing homes other than in name is not yet clear. But the movement toward funding from social service and housing dollars rather than health dollars may have important implications for the health orientation of the facilities. They may emphasize social and residential care without as much emphasis on health care as is required by nursing home certification regulations. This could make them less expensive, but it could also mean they are less effective or appeal to the wrong group, i.e., people who are not potential nursing home residents. Certainly, if they do serve as substitutes, one effect may be to save the States money by shifting costs to programs that do not involve large State matching requirements as does Medicaid.

Despite such efforts, nursing home expenditure growth in one form or another seems inevitable at least for the foreseeable future. As the elderly population increases and new discoveries are made to extend life, more patients will enter nursing homes simply because their medical and nursing needs are so great that they cannot be met without continuous care. Demand already exceeds supply of homes in most States, and the gap is likely to widen. Research is needed on the potential benefits and feasibility of improving reimbursement policies to encourage homes to operate efficiently while admitting only those patients who cannot be effectively served somewhere else (Weissert et. al., 1980). Increased Federal participation may also be demanded to offset some of the burden on the States. Pressures may also build to increase the proportion of the Federal budget devoted to services for the elderly above its current level of more than 30 percent of all Federal expenditures (Samuelson, 1978). In the meantime, the States are likely to use their policy tools of restrictive rates, utilization review, certificate-of-need review, and promotion of alternative care settings to hold down nursing home bed and expenditure growth.

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[2] Limited experience with home health care suggests that it too may increase total health services use (Hammond, 1979). Additional research is being sponsored by the National Center for Health Services Research.

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Section IV

Health Care Expenditures

Health Care Expenditures[a]

National Health Expenditures

Total health care expenditures in the United States for 1979 were $212.2 billion, a 12.5 percent increase over the previous year, and slightly greater than the 11.3 percent increase in the gross national product (GNP) for 1979 (table 60). During the past two decades, the health care share of the GNP increased from 5.3 to 9.0 percent. This has given rise to concern that health care expenditures are rising too fast and that the absolute levels are too high. Therefore, an understanding of the patterns and trends in the various components of health care spending is desirable.

This section discusses the components of expenditures for health care, and explains some of the reasons they are increasing. Health care prices are increasing, because, among other things, the costs of inputs are rising. Utilization is increasing because of the growth and aging of the population. Also, the nature of health care itself is changing as medical technology advances.

One of the most important factors contributing to the relative growth of the health care sector was the growth of the hospital subsector. In 1979, 40.2 percent of total health expenditures, or $85.3 billion, was for hospital care, a 12.5 percent increase over the previous year. In 1965, by comparison, hospital care accounted for 33.1 percent of national health care expenses.

Since hospital care has accounted for an increased share of the total health care dollar, it has been responsible for a disproportionate share of the relative growth of the health care sector during the past 15 years. However, during the past several years, the expenditure share for hospital care has remained stable. This was largely the result of increases in the expenditure share for nursing home care, thus showing that other subsectors are not immune from the inflationary pressures that have long plagued the hospital subsector (table 68).

Other long-run trends in expenditure shares that should be noted are: the decrease for drugs and drug sundries, from 12.4 percent in 1965 to 8.0 percent in 1979; the increase for nursing home care, from 4.9 percent in 1965 to 8.4 percent in 1979; and the decrease for research and medical facilities construction, from 8.2 percent in 1965 to 4.7 percent in 1979 (table 68). Interpretation of these expenditure share changes is facilitated by disaggregating total expenses into their various components.

Any expenditure has three components—the unit price of the item, the quantity purchased, and the quality of the item (if all of the items are not strictly identical). Each of these components must be examined to account for the increase in the whole. Specifically, the overall rise in health care expenditures has been attributable to:

- Increases in the price of care, which reflect (1) increases in the prices that providers pay for their inputs, (2) productivity lags between the health care sector and other sectors which, in turn, require wage increases to maintain the supply of labor, (3) increases in the market power of health care providers, and (4) increases in the complexity and resource intensity of the specific clinical services provided by health care providers.
- Increases in utilization, in terms of the volume of hospital admissions, outpatient and emergency room visits, office visits, and so on.
- Increases in the service intensity of diagnostic and treatment procedures.

The relative contributions of each of these factors to hospital expenditures are displayed in table A. Inflationary price increases in inputs to the hospital (i.e., the cost of labor, food, fuel, supplies, etc.) were responsible for more than half of the total increase in hospital expenditures, while utilization increases accounted for more than a tenth of the rise, and the remainder was from increases in service intensity and quality. The procedure used to obtain net service intensity tends to underestimate its role, because it is calculated as a residual and no allowance is made for substitution by the hospital in response to changes in prices.

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Table A. Annual increases in hospital expenditures, according to components: United States, 1970-79

Year	Total	Component		
		Price of care[1]	Utilization[2]	Service intensity[3]
		Percent annual increase		
1970	17.5	7.5	3.2	5.9
1971	11.0	6.4	-1.1	5.5
1972	12.1	5.8	1.6	4.3
1973	12.0	6.0	2.5	3.0
1974	16.0	10.1	3.3	2.0
1975	17.5	10.6	0.9	5.2
1976	19.1	8.8	3.6	5.7
1977	15.6	8.1	1.1	5.7
1978	12.8	8.4	0.6	3.4
1979	13.4	10.1	1.7	1.3
		Average annual increase		
1970-79	14.7	8.2	1.7	4.2

[1] Labor, food, fuel, supplies, etc.
[2] Inpatient day equivalents.
[3] Calculated as a residual category.

SOURCES: (American Hospital Association, 1970-79; Freeland, Anderson, and Schendler, 1979).

Given the sheer number of separate factors that can potentially contribute to health care costs, the inflationary problem in the health care sector is exceedingly complex. It involves changes in input prices, the nature of medical technology, the nature and incidence of illness, and the age and sex distribution of the population, as well as the nature of patient and provider responses to these changes. No simple answer can explain the behavior of health care expenditures. Research and policy must employ multiple approaches to address the various dimensions of the problem.

In the following sections, a brief review of research findings are presented on the three basic components of inflation in the health care sector: prices, utilization, and service intensity.

Prices

One reason why more is being spent for health care is that prices have risen. In this section, the overall behavior of health care prices is examined, and some alternative explanations of that behavior are offered. Finally, the behavior of the cost of inputs to the hospital—a significant inflationary factor—is discussed in more detail.

Inflation

Historically, medical care prices have consistently outpaced the growth of general consumer prices. General consumer prices showed an 87-percent rise between 1970 and 1979, compared with the medical care component of the Consumer Price Index that doubled in value over the same period (table 63). Only recently, as a result of accelerated costs for food, fuel, and housing, has the growth in consumer prices surpassed that of medical care.

Between 1978 and 1979, the Consumer Price Index less medical care grew by 11.5 percent, compared with 9.4 percent for medical care goods and services (table 64). One impact of this inflation is that rising prices have been the major component of the increase in health expenditures. Between 1973 and 1979, for example, 66 percent of the growth in health care spending could be attributed to prices. Further, price increases as a percentage of total health expenditures accounted for 72 percent of the increase in medical expenditures in 1979 (table 61).

A disaggregation of the medical care component of the Consumer Price Index reveals that charges for medical care services, particularly for hospital care, had the greatest impact on the differential in growth between medical and consumer prices (table 64). Hospital service charges, semi-private room charges, and operating room charges all showed annual percent changes in their indices in excess of 10 percent for selected periods between 1970 and 1978 (National Center for Health Statistics, 1980b).[1] Indeed, between 1971 and 1978, the adjusted hospital expense per inpatient day more than doubled (table 70). Increases in hospital charges have resulted, in part, from increases in the cost of goods and services that the hospital must purchase to provide care. Between 1972 and 1979, the Hospital Market Basket Index (American Hospital Association, 1980) increased at an average annual rate of 8.3 percent, and the National Hospital Input Price Index (Freeland, Anderson, and Schendler, 1979) showed approximately the same rate of change.

In contrast, the Consumer Price Index less medical expenses exhibited changes of 6.7 percent from 1970 to 1975 and 7.7 percent from 1975 to 1979. During the first half of the 1970's, fees for physician and dental services grew by 6.9 and 6.3 percent, respectively, with the former just exceeding the growth in general consumer prices. Between 1975 and 1979, however, physician fees accelerated to a 9.7 percent annual rate of growth and dentist fees grew by 7.2 percent, both surpassing the growth in consumer prices (table 64): Prices of other professional services, such as optometric services and routine laboratory tests, and medical care commodities, such as prescription and nonprescription drugs, grew at rates well below the Consumer Price Index between 1970 and 1975, and they have experienced rates of growth comparable to consumer prices from 1975 to 1978.

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[1] 1978 data were used, because the Bureau of Labor Statistics reclassified medical care services and commodity categories for 1979 data and separate information is not provided for certain hospital service charges and medical commodities for comparison during the 1970's.

Since 1978, however, the growth in the Consumer Price Index has outpaced the growth in prices of all items in the medical care component. Whether this latest development proves to be an aberration from or a reversal of the long-term relationship between medical care and consumer prices will depend on future trends in food, fuel, and capital costs.

In any event, the price trends previously discussed indicate that inflation is a major factor in the increases experienced in the health care sector, despite any weaknesses in price statistics. However, there are certain methodological problems associated with applying the Consumer Price Index and its medical care component to assess price movements.

The Consumer Price Index has been criticized on two counts: for lack of taking changes in the quality of health services and products into account; and for items priced not being representative of actual medical treatments and practices. Nevertheless, the medical care component of the Consumer Price Index is still the most widely used indicator of health care inflation.

Structure of the Market

The tendency for medical care prices to exhibit rates of increase historically surpassing those of general consumer prices reflects both the particular structural characteristics of the market for, and the nature of, medical care. The unique factors governing both the demand for and the supply of health care services have effectively insulated this market from those forces which, under the competitive model, work towards efficient use of resources. However, increasing prices may result from changes in underlying demand conditions, such as increasing income or health insurance, and in underlying supply conditions, such as increasing production costs.

Significant market features of the health care sector that have reduced competition and contributed to price inflation include:

Predominance of third-party payment for health care through government subsidies and private health insurance.—Since 1965, the year before Medicare and Medicaid were implemented, the share of third-party payment for health care services has increased from 48 percent to 68 percent in 1979 (table 67). Between 1965 and 1978, the share borne by Federal, State, and local government increased from 22 percent to 40 percent, and the share for people 65 years of age and over increased from 30 percent to 63 percent (table 73). Although the share paid by private health insurance has remained fairly stable for the general population, its distribution between age groups has altered. The proportion of medical care expenditures paid by private insurance on behalf of people under 65 years of age increased from 27 percent in 1966 to 36 percent in 1977, offsetting the decline in such payments for the elderly—from 15.9 percent to 5.8 percent for the same time period (National Center for Health Statistics, 1980b).

The proportion of the population with some form of health insurance coverage reached 90 percent by 1976. The provision of third-party coverage for health care expenses separates payer from consumer, and hence, provides an incentive for consumers to seek and providers to supply more medical care (Newhouse, 1977).[2] In the hospital sector, where third-party payments cover almost 90 percent of the costs of care, the subsidy effect has been found to increase the demand for both the quantity and quality (i.e., sophistication) of care (Feldstein and Taylor, 1977; Feldstein, 1977).

Role of the physician as agent of the consumer.—Lack of consumer knowledge regarding the identification and treatment of illness and legal constraints on the use of medical care resources have created a relationship in which the physician acts as "agent" for the consumer-patient (Feldstein, 1974). As such, the physician demands various medical care services on behalf of the consumer and supplies other medical care directly to the consumer. With extensive insurance coverage and fee-for-service reimbursement, however, the agency relationship has the potential to yield excessive resource use. This will occur when providers allow their preferences for inputs or income to dictate the mode of treatment, rather than concern over the costs and benefits to the patient of alternative types of care.

The ability of physicians to exercise discretionary, demand-inducing behavior has led to one provocative interpretation that physician fees are set to offset the possible deterioration in "target" income levels resulting from increases in the physician-to-population density. If this view is correct, past public policy designed to increase physician supply may have contributed to the inflation in physician fees. A recent alternative interpretation posits that as absolute physician supply increases, consumer information on price and quality is more costly to obtain. Consequently, consumers are less inclined to seek alternative sources of care when providers raise prices in physician-rich market areas (Pauly and Satterthwaite, 1980). However, the available empirical research has failed to reach a consensus in support of target income or demand-inducing behavior as the primary mechanism governing the market for physicians' services (Sloan and Feldman, 1978). Recent evidence suggests that while physicians have some degree of market power, their ability to raise fees is limited by market forces (Hadley, Holahan, and Scanlon, 1979).

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[2] Technically speaking, two kinds of subsidies to medical care demand are present under existing forms of public and private health insurance. The first arises through the decline in user prices because of co-payment provisions. The second results from the tax treatment of employer and employee purchases of health insurance (Mitchell and Vogel, 1975). The latter encourages increases in expenditures for health insurance, and this leads to increased medical care utilization as discussed above.

Provision of a significant portion of medical care (i.e., hospital) and insurance services by nonprofit institutions.—Since managers of nonprofit firms cannot distribute "profits" separately, incentives arise to depart from the most profitable or least costly mode of operation for producing a given product. Consequently, the production and distribution of medical care and health insurance services organized on a nonprofit basis have been characterized by a variety of nonmonetary considerations. These include enhancing the prestige of the institution, expanding the quantity and/or quality of hospital output, and broadening the scope of insurance coverage (Clarkson, 1972; Jacobs, 1974; Bays, 1979; Frech, 1976; Frech and Ginsburg, 1978).

Competition among nonprofit hospitals is not likely to be based upon price, but rather upon the availability of technically sophisticated, cost-enhancing services (Salkever, 1978). Similarly, nonprofit and commercial health insurers have been alleged to compete through completeness of insurance coverage, which has the effect of increasing the demand and cost of medical care, rather than through premiums on a common insurance policy (Frech and Ginsburg, 1978).

Reimbursement of hospital services on a cost-incurred basis and of physicians on a fee-for-service basis.—In recent years, more than 50 percent of the revenue received by hospitals has been determined retrospectively on the basis of actual costs incurred (American Medical Association, 1978). On this basis, it has been possible for hospitals to pass the costs of excessive resource use and expensive medical care technology to third-party payers. Fee-for-service payment of physicians may also encourage increases in the provision of services, since income is tied to units of service provided (Monsma, 1970; Pauly, 1970; Reinhardt, 1975).

In addition, broad application of "usual, customary, and reasonable" reimbursement criteria (as in Medicare and Blue Shield plans) can lead to inflation in fee structures. Under such a payment mechanism, the physician's customary charge for a procedure is the median charge by that physician in the previous calendar year. The 75th percentile of such customary charges for all physicians (often adjusted for specialty) determines the prevailing charge. The reasonable charge (i.e. the maximum amount to be reimbursed in the next fiscal year) is the lowest amount of three charges—the actual charge billed, the customary charge, or the prevailing charge (Schieber et al., 1976). Physicians have little incentive to compete by price if payment is made at the prevailing charge level in the area. Since such reimbursement is based upon the distribution of actual fees, an increase in fees of all providers in the area can raise future reimbursement levels.

To counteract this potential problem, regulations were promulgated in 1976 to limit increases in prevailing charges under the Medicare and Medicaid programs to those rises in the cost of maintaining an office practice and in the general earnings of the labor force. This has reduced Medicare reimbursements to physicians below what they would have otherwise been, but the regulations do not address how physicians determine actual patient charges. Moreover, as physician fees continue to escalate faster than the charge limits, an increasing number of claims will be paid at the Medicare prevailing charge, so that existing geographic and specialty reimbursement differences become incorporated into a de facto fee schedule for Medicare. Such a scheme may provide inappropriate signals regarding current demands for the various types of physician services, and it may provide incentives for unnecessary utilization of these services (Burney et al., 1979).

Barriers to entry, input substitution, and price information.—Legal requirements such as occupational licensure seek to protect the public by maintaining quality standards, but they may inhibit potential cost savings by impeding substitution of lower salaried personnel on given tasks (Frech, 1974; Monheit, 1980; White, 1978). State laws and informal prohibitions on advertising by professional associations have had the effect of making it more difficult for consumers to secure information on price and quality, thereby preventing them from considering these factors in their decisionmaking (Benham, 1972; Feldman and Begun, 1978).

Costs of Inputs

The structural factors listed above act to impede possible cost-saving responses by providers. This becomes even more significant when their costs are rising. A summary of the changes in the amounts, mix, and prices of inputs employed by one particular set of providers—hospitals—over the past decade illustrates this point.

Quantity of hospital inputs.—Labor, capital, medical supplies, food, and purchased services are the primary inputs used to produce hospital services. Hospital labor intensity per patient day increased by 19 percent between 1971 and 1978. On the average, hospitals employed 272 persons per 100 patients at the beginning of the 1970's; by 1978, 323 hospital employees serviced 100 patients (table 70). The percent of hospitals reporting availability of specific facilities and services has increased markedly during the past two decades (Russell, 1979). For example, in 1958, approximately 25 percent of large community hospitals (300 or more beds) reported having an intensive care unit (ICU). By 1976, most large hospitals reported the presence of both ICU's and coronary care units (CCU's), while 57 percent of medium-sized hospitals (200-299 beds) and 29 percent of smaller hospitals (100-199 beds) also reported their presence (Russell, 1979). The first end-stage renal dialysis programs were established in the early 1960's. By 1976, more than 50 percent of large hospitals and 20 percent of medium-sized hospitals reported treatment programs (Russell, 1979).

Looking at specific items of equipment, similar rates of diffusion are documented. For example, in 1960, approximately 70 percent of large hospitals, 40 percent of medium-sized hospitals, and 10 percent of smaller hospitals reported the presence of an electroencephalograph (EEG). By the late 1970's, almost 100 percent of large hospitals reported their presence, followed by 90 percent of medium-sized hospitals and 40 percent of smaller hospitals (Russell, 1979). Availability of real assets provides a more comprehensive indicator of capital.[3] Real assets per bed increased by 28 percent and real assets per 1,000 population increased by 37 percent during the period 1971-77 (Schweitzer, 1980).[4]

Another view of input use by hospitals can be provided by average expenditure share per operating dollar for various expense categories. Data for 1977 indicate that payroll expenses, employee benefits, and capital expenditures comprised the three largest categories of hospital expenditures (Freeland, Anderson, and Schendler, 1979). Looking at variation in labor and nonlabor shares over time, total labor costs have declined from 64 percent to 57 percent of total hospital costs since 1971 (table 70). Thus, using the total operating budget as an output proxy, the hospital industry is becoming relatively more capital intensive.

Hospital wages.—Between 1959 and 1969, hospital wages increased at a rate of more than 1 percent annually above wage increases in all industries (Fuchs, 1975). Many observers argued that hospital employees were simply "catching up" since their wages had been low relative to comparable employees in other industries. Using 1960 and 1970 Census data, Fuchs (1975) tested this hypothesis and concluded that while health workers were poorly paid relative to workers in other industries in 1959, by 1969 they had risen to parity.

Feldstein and Taylor (1977), using Bureau of Labor Statistics data for 1968-75, compared later relative wage gains and concluded that hospital employees were better paid by the mid-1970's than their counterparts. However, unlike Fuchs, Feldstein and Taylor did not adjust for differences in the quality and skills of the hospital work force. These investigators hypothesized that market imperfections such as full-cost reimbursement, the absence of cost-minimizing behavior by hospitals, philanthropic hospital managers, and other related factors may have been responsible for the later wage gains in the hospital sector.

In a recent study, Sloan and Steinwald (1979) compared gains in hospital employee real wages to wage gains of relevant employees in other sectors, after adjusting for worker quality. They concluded that, during the 1960's, hospital employee real wages rose both absolutely and relative to other employees, and that worker quality increased considerably, compared to industry reference groups. In contrast, during the 1970's, hospital employees did not keep pace with inflation. In fact, Sloan and Steinwald found that occupation-specific real wages peaked around 1972, and in many cases declined thereafter. They concluded that by the mid to late 1970's, hospital employee quality-adjusted wages were lower than wages of reference industry employees.

Turning to determinants of wage increases, Sloan and Steinwald found that the growth of third-party reimbursement and of real per capita income during the 1960's was partially responsible for large wage gains of hospital employees during that time. They also found that wage rates were positively associated with minimum wage laws and the presence of unions and mandatory licensure regulations. However, explanation of the recent downturn in relative quality-adjusted wages must await further research.

Hospital capital costs.—Capital costs faced by hospitals are treated differently than those faced by business firms because of third-party reimbursement of interest and depreciation expenses and the eligibility of nonprofit hospitals for tax exempt bonds and gifts. These unusual aspects of hospital capital costs are addressed below.

The cost of capital is properly assessed by the most valuable alternative use of internal funds (i.e., equity), nondebt external funds (i.e., gifts and grants), and debt (Emrich, 1980; Long, 1979). While third-party payers ordinarily fully reimburse the cost of debt capital (interest expense), hospitals and third-party payers generally treat internal funds and gifts as cost-free. That is, they do not explicitly acknowledge that those funds could be used for other purposes, such as investments that would earn interest. Until recently, hospitals rarely compared expected rates of return on alternative investments; and third-party payers do not consider use of internal funds and gifts as allowable expenses (except through depreciation of assets). For these reasons, it is not possible to assess the true price paid by hospitals for capital, and hence, it is not known exactly how this is changing over time.

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[3] Lack of uniform hospital financial accounting methods, including variation in purchasing and depreciation, introduces measurement error in hospital fixed assets accounts, so that variation over time (or across hospitals) may be, in part, artifacts of accounting methods.

[4] Schweitzer's estimates are derived from asset data compiled by the American Hospital Association. Because of revisions in the reporting format, such data are unavailable for 1978.

Financing sources for capital projects vary across the capital project size, hospital size, and ownership categories, but on the average there has been a trend away from government grants, philanthropy, and hospital reserves. Dependence of the hospital on debt financing has increased markedly over the past two decades. In 1969, approximately 35 percent of capital funds were obtained by borrowing (Van Nostrand, 1977). By 1973, this figure had risen to 54 percent. By 1978, the debt figure had increased to 61 percent (Mullner et al., 1980).

Six major types of debt instruments were used by hospitals to finance their projects in 1977: commercial loans (7 percent of debt), taxable bond issues (4 percent), tax-exempt bond issues (39 percent), Internal Revenue Service 63-20 tax-exempt bond issues (3 percent), Department of Housing and Urban Development loan guarantees (6 percent), and Hill-Burton Act loan guarantees (0.7 percent). Among large community hospitals, tax-exempt bonds were the dominant means of financing capital construction; among medium-sized hospitals, Department of Housing and Urban Development loan guarantees represented the largest source (American Hospital Association, 1978).

Depending upon the bond rating, tax-exempt instruments provide an interest subsidy to hospitals of several points below market rate (Schweitzer, 1980). Thus, in terms of interest rates alone, the cost of borrowing for hospitals lags behind market rates by several percentage points. However, the relevant issue regarding hospital capital costs is not the interest rate per se, but the amount of debt. In 1976 alone, hospitals added $2.7 billion in debt (Schweitzer, 1980), and debt service is rapidly growing. In 1977, it was estimated that payments for depreciation and interest by Medicare alone were increasing by more than $87 million annually (Van Nostrand, 1977).

One reason for the increased reliance on debt financing is that hospitals are usually reimbursed on the historical value of assets. As a result, depreciation accounts are increasingly insufficient to finance replacement and upgrading mainly because of price inflation, but also because of technological advancement. Thus, the full cost of capital is being shifted forward in time as hospitals must borrow to expand or modernize.

Utilization

Use of health services has increased considerably in recent decades, thereby increasing expenditures for health care. This overall increase has resulted from growth in the population and growth in the per capita use of health services. Between 1965 and 1978, the U.S. resident population increased by 12.7 percent to 218 million. Thus, even if per capita utilization rates had not changed, the total volume of services would have increased, contributing to the rise in health care expenditures.

Utilization rates have also risen. They increased partly because of public policies that were implemented to improve access to health care and partly because of changes that occurred in the age, sex, and racial structure of the population. From 1960 to 1978, the number of people 65 years of age and over increased from 9.23 percent of the population to 10.66 percent, the number of women rose from 50.74 percent of the population to 51.75 percent, and people of all races other than white increased from 11.43 percent of the population to 13.46 percent. Since these three population groups tend to show greater use of health services, increases in their percentage of the population are reflected in increased utilization rates.

The following discussion documents the general growth of utilization rates, explores its causes, and describes recent initiatives to enhance appropriate use of health services.[5]

Growth of Utilization

Rapid growth in utilization of health care has occurred during the past two decades, especially among groups previously facing the greatest barriers to access. For example, the number of physician visits per person per year increased from 4.5 in 1964 to 4.8 in 1978. For people other than white, however, the visit rate increased from 3.3 to 4.7. Between 1965 and 1978, total discharges from short-stay hospitals per 1,000 population rose 8.5 percent overall, but for people 65 years of age and over, they increased 44.7 percent. On the other hand, the average length of stay declined 5.1 percent overall, while showing a 15.4 percent decline for the elderly. The net result was that the total days of care per 1,000 population during this period rose 1.8 percent for the population as a whole, but increased 21.5 percent for the population 65 years of age and over. Surgery rates for the country as a whole rose by 25.5 percent between

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[5] See also "Use of Ambulatory Care by the Poor and Nonpoor" and "Regional and Income Differentials in Surgery" in this report.

1965 and 1978; but for people 65 years of age and over, the rate increased by 64.7 percent.

Changes in utilization by income level were also quite striking. In 1964, people with family incomes below $3,000 per year (approximately 20 percent of the population) averaged 4.3 physician visits per year. By 1978, those with family incomes under $7,000 (20 percent of the population) averaged 5.7 visits per year. Physician visits for the remaining 80 percent of the population averaged 4.6 per year in both 1964 and 1978. For people with family incomes under $3,000, total days in short-stay hospitals amounted to 148 days per 100 persons for 1963-65, compared with 162 days for people with family incomes below $7,000 for 1976-78; this represented a 9.5-percent increase. Hospital utilization for the remaining 80 percent of the population actually decreased by 13.5 percent over the same period, from 96 days per 100 persons per year to 83 days.

To a considerable extent, these trends were the result of deliberate government policy. Aware of the large gap between perceived health care needs and ability to obtain that care, the Federal Government implemented several kinds of policies. First, and probably most important, were "demand-generating" programs, such as Medicare and Medicaid, aimed at improving the ability of the aged and medically needy groups to pay for health care. Of secondary importance were "supply-generating" programs aimed at improving the capacity of the health delivery system to provide care. Important "supply-generating" legislation included the Hospital Survey and Construction Act of 1946 (Hill-Burton Act), the Health Professions Education Assistance Act of 1963, and their subsequent amendments. These programs greatly increased the supply of hospital facilities, physicians, and allied health personnel.[6]

At the same time that public policies were leading to higher utilization, the ability of the nonaged and nonpoor population to pay for health care was being greatly enhanced by greater insurance coverage for workers and their families. The major motivation was the desire by workers to protect their families from the rapidly rising costs of medical care. However, a variety of other incentives induced employees to demand and employers to supply health insurance, and employee health insurance coverage grew.

The willingness of employers to grant better insurance coverage in bargaining negotiations results both from existing tax regulations and from bargaining arrangements. As a fringe benefit, the employer's contribution represents non-taxable income to the employee. For employees who itemize their tax returns, their own contribution represents a tax deduction. Also, for employers bound by cost-of-living escalators in their labor contracts, a rising cost of living does not immediately lead to higher employer contributions to their employees' health plans. That is, contributions to health plans are fixed for the duration of the contract period (usually 12 months), regardless of the rate of inflation elsewhere in the economy. In contrast, cost-of-living adjustments are added to the employee's basic hourly wage at a rate which is recalculated every 3 months, and the size of this cannot be foreseen in advance. At the beginning of the contract period, the corporate planner has more certain estimates of health insurance costs than of actual wage costs. Therefore, better insurance coverage is both an attractive benefit to employees and a particularly cost-effective concession for employers.

The net effect of these public policies and private actions was that the percent of the U.S. population covered by health insurance rose from 74 percent in 1963 to 90 percent in 1978, and access by Americans to the health care system, especially by the aged and poor, increased substantially. Given that both access and equity of access appear to have risen, a logical question is whether this greater use of health services has led to improved health status. However, this question raises exceedingly difficult issues of measurement and research design, and a careful discussion of the relationship between utilization and health status is beyond the scope of this section.

Service Intensity

Another factor contributing to the increases in health care expenditures during the past three decades is changes in inputs of medical care goods and services. The net effect has been an increase in the total quantity of resources consumed per treatment. Hence, the cost of health care services would continue to rise even if inflation in the general economy and growth or change in the population were not occurring. Changes in the treatment regimens for various diseases may reflect technological innovations such as new drugs (e.g., antibiotics), new procedures (e.g., endoscopy, nuclear scans, coronary artery bypass surgery, computed tomography, renal dialysis, and organ transplants), or new modes of delivering care (e.g., coronary intensive care units, neonatal intensive care units, and ambulatory surgical units). In addition, treatment changes may reflect a different mix of existing medical services, such as changes in the number and types of diagnostic tests, substitution of specialist physicians for general practitioners, or changes in the propensity to admit to the hospital or to perform surgery. As shown in table A, increases in service intensity alone caused an estimated average annual increase in hospital expenditures of 4.2 percent from 1970 to 1979. This intensity increase is seen, for example, in both inpatient and outpatient sectors. The number of personnel per occupied bed in non-Federal short-term general hospitals in the United States increased from 2.47 in 1968 to 3.23 in 1978, or 30.8 percent (American Hospital Association, 1979). The average size of a prescription, in terms of number of dosage units, increased by 39.2 percent during this same time period (Trapnell, 1979).

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[6] The National Health Planning and Resources Development Act of 1974 is an important example of more recent legislation designed to control the extensive growth in supply that resulted from this earlier legislation.

The American Hospital Association's Hospital Intensity Index rose by 55.4 percent during the period January 1970 through October 1979 (Cohen and Bachofer, 1980). This index measures the quantities of 37 hospital inputs provided per typical patient day, such as lab tests, X-rays, prescriptions, visits to the operating room, nursing manhours, and the like, weighted by base year costs (Phillip, 1977).

In one study that examined patterns of treatment in a large multi-specialty, fee-for-service group practice in Northern California for the 20-year period 1951-71, dramatic changes were found (National Center for Health Services Research, 1977). For example, the average number of laboratory tests for perforated appendicitis increased from 5.3 in 1951 to 31.0 in 1971. For maternity care, the number of tests rose from 4.8 to 13.5 during this period. For breast cancer, the number of tests increased from 5.9 to 27.4. Increases were also found for X-rays, intravenous solutions, electrocardiograms, and inhalation therapy. In sharp contrast, the average length of stay for hospitalized cases showed a downward trend during the same period. Length of stay for a normal delivery declined from 4.6 days to 2.8 days, and for breast cancer it declined from 12.7 days to 8.9 days. This latter effect was the major cost-saving change in treatment patterns found in this study. Other cost-saving changes included an increase in the percent of deliveries without the use of a general anesthetic, substitution of partial mastectomies for radical mastectomies in the treatment of breast cancer, and a switch from inpatient to ambulatory treatment for forearm fractures. Despite these and other cost-saving changes, the overall effect was increased costs for treatment.

A study of service intensity of hospital care estimated that 38.7 percent of the rise in the adjusted cost per patient-day was caused by more intense utilization of nine selected medical services—operating room visits, pathology tests, nuclear medicine procedures, anesthesia, prescriptions, laboratory tests, diagnostic radiology procedures, therapeutic radiology procedures, and units of blood—and 41.6 percent of the adjusted cost per admission was the result of rising use of these services. Moreover, the relative impact of changes in service intensity on hospital cost inflation was found to increase during the period 1968-71 (Redisch, 1974).

Few studies of service intensity in the medical care sector have been conducted and many questions remain unanswered. Although service intensity is increasing, it is not known why these "extra" services were presented. Were patients sicker? Was higher quality care being delivered? Were providers creating demand to maintain their incomes or were they practicing "defensive medicine?" Were patients simply demanding more services? A number of possible explanations for this increasing service intensity have been offered, including increasing demand, third-party reimbursement policies, technological progress, redundancy in facilities, changing case-mix, inefficiency, and the changing nature of the output.

Increased demand for medical care arising out of increased insurance coverage can cause increases in service intensity in the following way. As the net price of medical care to the patient decreases, individuals demand higher quality care and more amenities, such as better food, more nurses, and better accommodations. The increasing insurance coverage, by reducing the price elasticity of demand, allows the provider to charge higher prices without reducing total utilization. The new revenues may then be used to purchase new technology, hire additional staff, and raise patient amenities (Feldstein, 1971).

Providers may have relative preference for acquiring new and complex technology; hospital administrators obtain satisfaction from having the best-equipped, most modern facilities. These facilities also serve as "technical amenities" to physicians, and hence, may serve as a means of attracting the most highly-qualified physicians to the hospital. Specialized medical technicians must then be hired to operate the new equipment, and more complex modes of treatment become the rule. This may be the result of inter-hospital competition for physicians and patients, and it is therefore important to know how the availability of competing sources of medical care affects service intensity. Where there are many competitors, competition takes place mainly along the quality dimension. This may be an interaction effect between competition and insurance coverage (Lee, 1971; Davis, 1971; Salkever, 1978).

Another hypothesis is that techological progress in the medical care sector has been resource-intensive in that the new methods that have been developed to combat disease and prolong life require highly specialized and complex labor and capital inputs. Some examples of such methods include organ transplantation, dialysis, continuous cardiac monitoring, radiation therapy, and computed tomography (Office of Research and Statistics, 1972). Acquisition of new capital has several cost-increasing components: total purchase costs (purchase price and cost of financing); local production costs (total direct and indirect expenditures to produce the service for which the capital item was obtained, including labor and supplies); induced and implicit costs (to produce other related services, for example, additional medical services required to support a new program); and external costs which do not appear on the providers' books (such as increased production costs of nearby providers). One review of empirical data on several capital acquisitions concludes that initial purchase costs are ordinarily less than 10 percent of local production costs, but this ratio varies a great deal, and induced and implicit costs may be more important than production costs (Brown and Marks, 1980).

Another potential factor behind increasing service intensity may be an expansion in the scope of services offered by hospitals, which reflects a reorganization of the delivery of services within the medical care sector and a change in the nature of output. For example, many short-term general hospitals now provide psychiatric inpatient and outpatient services, expanded social welfare services, and expanded emergency room services. Many of these services actually become overhead in that they are financed by all patients through the average daily charge (Office of Research and Statistics, 1972).

Another possible explanation of increased service intensity is the practice of "defensive medicine" by physicians. The threat of malpractice suits may induce physicians to order more extensive laboratory tests and X-rays, hospitalize marginal cases, and keep patients in the hospital longer. Increased insurance coverage lowers the net price of services to the patient and reduces the financial burden of these increased services, and this in turn reduces the incentives to economize on the part of both the physician and the patient (Office of Research and Statistics, 1972). While many physicians report that they are practicing "defensively," there have been no well-designed studies of the direct influence of "defensiveness" on patterns of practice (Trancredi and Barondness, 1978).

A related hypothesis is that of "demand creation" by physicians. Given the physician's role as an "agent" of the patient, which is taken on because the patient lacks the necessary knowledge to evaluate the quality, efficacy, or need for medical care, the physician is able to control the delivery of services to the patient. This control is reinforced by extensive health insurance coverage, which reduces the patient's concern over the relative costs of any treatment option. In response to a perceived threat to his income, such as controls on reimbursement or increased supply of physicians in the area, the physician increases his fees and/or the prescribed quantities of office visits, laboratory services, X-rays, surgical procedures, and the like to maintain his income flow. One study of the impact of price controls under the Economic Stabilization Program (ESP), which was in effect from August 1971 through April 1974, showed that while ESP was relatively successful in slowing the rate of increase of physician fees for specific services, physicians were able to subvert these controls by shifting to a relatively more expensive mix of services (Hadley, Holahan, and Scanlon, 1979). The same effect was noted for hospital care; during the ESP period, the price of hospital care was controlled, but revenues per unit of output rose substantially, revealing a shift towards a more costly average product (Ginsburg, 1978).

Another factor that could, in part, account for the changes in service intensity over time is changes in the nature of illnesses being treated in the hospital, clinic, and physician's office, in terms of increased severity and complexity. Table B shows the relative contributions of changes in case mix and changes in diagnosis-specific length of stay to changes in overall average length of stay for PAS hospitals for the period 1964-76.[7] The case-mix index measures the change in overall average length of stay because of the change in the mix of diagnoses admitted from one year to the next, holding diagnosis-specific length of stay constant. The diagnosis-specific length of stay index measures the change in overall average length of stay that would result from changes in patterns of practice regarding length of stay for specific diagnoses, holding diagnosis proportions constant.

Table B. Changes in case mix, diagnosis-specific length of stay and overall average length of stay for Professional Activities Study hospitals: United States, selected years 1964-76

Year	*Case-mix index*[1]	*Diagnosis-specific length of stay index*[2]	*Overall average length of stay in days*
1964.........	100.00	100.00	7.2
1965.........	102.36	109.15	7.3
1967.........	111.93	102.50	7.6
1969.........	108.63	107.77	7.7
1970.........	101.03	97.29	7.5
1971.........	103.60	93.90	7.4
1972.........	107.01	90.38	7.3
1973.........	108.07	88.20	7.1
1974.........	110.66	85.42	7.1
1975.........	112.41	83.62	7.0
1976.........	113.69	81.66	6.9

[1] Change in diagnosis-mix proportions, weighted by length of stay.
[2] Change in diagnostic-specific length of stay, weighted by diagnostic proportions.

SOURCES: (Rafferty and Hornbrook, 1979; Commission on Professional and Hospital Activities, 1977).

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[7] PAS hospitals are those non-Federal, short-term general hospitals in the United States that participate in the Professional Activities Study, a discharge abstract service sponsored by the Commission on Professional and Hospital Activities. The number of PAS hospitals rose from 319 hospitals in 1964 to 1,877 in 1976. While not a probability sample, PAS hospitals can be considered to be typical of most short-term general hospitals in this country (Commission on Professional and Hospital Activities, 1977).

Since 1970, the mix of cases admitted to PAS hospitals has been shifting steadily towards longer staying types of diseases, so that the overall severity of patients treated can be said to have increased. Thus, case-mix changes may be playing a significant role in the current hospital cost spiral.

Diagnostic-specific lengths of stay have been decreasing continually and dramatically since 1969. Despite the increase in the proportion of longer stay case types in these hospitals, overall average length of stay has been declining. This means that treatment regimens are being cut off earlier and/or compressed into fewer days; this may be increasing service intensity per day of care with resultant implications for hospital output.[8] Although presented as distinct factors, the relationships previously described are not mutually exclusive. All of the factors identified should be included to achieve a complete explanation of service intensity variations. The greater use of inputs per treatment, patient day, or visit reflects a complex interaction among patient's preferences and the preferences of hospital administrators and physicians. A complete model of the utilization of hospital services would take into account patient, physician, community, and hospital characteristics.

Anti-Inflation Strategies

In recent years, a variety of policy initiatives have been proposed and implemented to deal directly with the rise in medical care costs.[9] These include direct incentives for the more efficient use of health services, direct controls on the prices of these services, indirect financial incentives, and others. Some of the major programs include the following:

Initiatives to Increase the Appropriateness of Care

A number of public and private initiatives have been developed to reduce the extent of inappropriate utilization. A major governmental effort involves development of Professional Standards Review Organizations (PSRO's). The PSRO program, mandated by the Social Security Amendments of 1972 (Public Law 92-603), requires localities to develop PSRO's staffed by local physicians, osteopaths, and nonphysicians. These PSRO's review services provided under the Medicare, Medicaid, and Maternal and Child Health programs. In particular, they establish criteria for judging whether patient services are medically necessary and provided in an appropriate setting, and whether diagnosis and treatment are consistent with professional norms.

Recent evidence indicates that PSRO's are beginning to reduce utilization. The Health Care Financing Administration annually conducts an evaluation of the PSRO Program. The 1978 evaluation indicated that, as of 1977, the average active PSRO had reduced both days of care per 1,000 Medicare enrollees and hospital discharges per 1,000 enrollees by statistically significant amounts. However, no impact was evident on the average length of stay (Health Care Financing Administration, 1979a). While reductions in use varied among PSRO's, the reductions were concentrated in the Northeast and West. These results indicated improved PSRO effectiveness when compared to earlier evaluations (Institute of Medicine, 1976; Health Services Administration, 1977). However, a more complete assessment requires an examination of whether such reduced utilization has affected either the quality of care or the health status of Medicare enrollees.

One procedure whereby PSRO's evaluate the appropriateness of utilization is concurrent review. Here, judgments about the necessity of admission and appropriate length of stay are made early in the admission episode, and services actually provided are reassessed periodically during the stay. According to recent evaluations by the Health Care Financing Administration (1979a), PSRO concurrent review programs have now reached the point where dollar benefits of reduced utilization exceed administrative costs of concurrent review, indicating increasing cost effectiveness.

The private and public sectors have established second opinion and prior approval programs to examine the appropriateness of utilization. Second opinion programs are meant to reduce hospitalization and surgical procedures by requiring patients to obtain the advice of at least two physicians as to whether surgery is desirable. One study analyzed the effectiveness of a second opinion program for the period 1972-78 with a clientele of 660,000 persons. Results suggest that this program—run jointly by the Cornell University Medical College and six metropolitan New York labor unions—substantially reduced the probability of surgery (McCarthy and Finkel, 1978). More specifically, 27.6 percent of those advised to have elective surgery by the first physician were told that the surgery was unnecessary by the second physician, a consulting board-certified specialist. As of 1 year after the second opinion consultation, 77.9 percent of the "not-confirmed for surgery" group had chosen not to have the operation. Furthermore, of those who chose to forego surgery, nearly two-thirds had no medical treatment within that year.

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[8] One study has shown that hospitals that provide more specific services to patients tend to have better than expected outcomes for these patients. However, patients treated in hospitals that tend to keep patients in longer for the particular diagnosis experienced worse outcomes than expected (Flood et al., 1979).

[9] A comprehensive summary of cost containment efforts is contained in *Health, United States, 1978* (National Center for Health Statistics, 1978).

Similar programs are growing rapidly. For example, as of January 1980, 47 Blue Shield plans actively promoted free second opinion programs. Most of the remaining 22 Blue Shield programs and 68 Blue Cross programs will pay all or part of the costs of a second opinion consultation, even if no formal second opinion program is in place (Blue Cross Association, 1980). The public sector has also developed second opinion programs. For example, Medicare patients who voluntarily seek a second opinion will be reimbursed. Also, Massachusetts and Michigan have both instituted mandatory second opinion programs for Medicaid patients (Health Care Financing Administration, 1980b).

Prior approval programs have been instituted by a number of labor unions. Here, the provider must justify the need for a hospital admission or other expensive service to a peer review committee, a State agent, or a representative of the union's insurance company. Prior approval is also required by some State Medicaid programs for specified medical or dental services (Committee on Interstate and Foreign Commerce, 1976).

Corporations are finding ways to reduce health costs through strategies that indirectly reduce utilization, either in the short or long term. Such strategies include: offering Health Maintenance Organization memberships to their employees, setting up prevention and screening programs, and self-insuring their employees (Business Week, 1978). While Health Maintenance Organization membership is widely held to reduce hospitalization, the impact of the other programs is still in doubt.

State Rate-Setting Programs

In an attempt to sever the link between inefficient resource use and payment based upon actual costs incurred, a number of States have developed regulatory programs designed to reimburse hospitals by predetermined per diem or per case rates. These States vary regarding payer groups covered and receipt of special waivers granted by the Medicare program. The latter permits the prospective rate to be applied to Medicare recipients. In general, rates have been established by review of budgets, cost structures and service volumes, negotiations with institutions, comparisons with similar hospitals, planning agency recommendations, and movements in economic indicators (Bauer, 1977).

Econometric evaluations of rate-setting programs in the early 1970's in Rhode Island, New Jersey, and New York, performed for the Office of Research and Statistics, Social Security Administration, were reviewed by Hellinger (1978). He concluded that only in New York was a statistically significant negative impact of prospective rate setting on cost per patient stay ascertained. Rate setting in New Jersey and Rhode Island failed to display significant independent effects on costs; the experience of rate setting in the latter State could not be separated from the effect of the Economic Stabilization Program. The reduction in the rate of increase in average cost per patient day and average costs per admission, found in five hospitals in Western Pennsylvania that participated in a Blue Cross prospective reimbursement experiment, was viewed as inconclusive for two reasons. The first was that there was such a small number of hospitals involved, and the second was that there was a possibility of self-selection bias (i.e., the likelihood that their choice to participate was governed by their ability to control costs).

A similar examination of these studies plus a review of research on programs in upstate New York and Indiana by Salkever (1979) is far more critical of research design, methodology, and interpretation of econometric results. The finding that the Indiana program has held down costs is viewed as tentative, and Hellinger's appraisal of the New York experience is regarded as questionable. Finally, claims of success in abating the rate of increase in costs by rate-setting commissions in States such as Connecticut and Maryland should be qualified since their experience has not been subject to rigorous econometric testing (Feldstein, 1979).

Recently, Biles, Schramm, and Atkinson (1980) argued that a valid assessment of the impact of rate setting requires an examination of more current data. They claim that early evaluations were conducted prior to 1975 when rate-setting programs were still in their infancy and not yet fully operational. Further, the impact of the Economic Stabilization Program (August 1971 to April 1974) in States without rate-setting programs may have blurred any comparison with States conducting rate review. Using State data compiled by the American Hospital Association, these authors computed annual percentage increases in hospital expense per equivalent admission for each year between 1970 and 1978. The mean yearly rates of increase for States with rate-setting programs were compared to those of States without rate review. From 1976 to 1978, the average annual rate of increase in hospital costs in rate-setting States was found to be 11.2 percent, compared to 14.3 percent in States without rate review.

While these results suggest that mandatory prospective rate-setting programs may have the potential to contain hospital costs, a complete econometric analysis is required to isolate the influence of rate review from any underlying structural changes and other regulatory programs affecting the hospital sector. For example, the data displayed by Biles, Schramm, and Atkinson show that the rate of increase in expense per equivalent admission was decling in States with rate review as well as in States without rate review between 1976 and 1978. It is not possible to determine whether a more complete analysis would increase or decrease the estimated effects of rate setting. Moreover, there is a need to further examine the effect of rate setting on aspects of utilization such as case-mix and service intensity.

Toward this end, the Office of Research, Demonstrations, and Statistics, Health Care Financing Administration, is sponsoring a national hospital rate-setting study with the aim of resolving these complex evaluative issues. Based on an analysis of the characteristics of the specific State programs, it is hypothesized in this study that the rate-setting programs in Maryland, New York, New Jersey, and Washington should result in reductions in the volume and intensity of services, with concomitant effects on costs per case and per day. These programs mandate either formal budget screens or formula-based reimbursement, and have implemented direct and indirect controls on occupancy rates, length of stay, and service expansion (Abt Associates, Inc., 1979).

Mandatory Wage and Price Controls

Between August 15, 1971 and April 30, 1974, mandatory wage and price controls were imposed on the national economy through the Economic Stabilization Program (ESP) and extended to the health care sector. For providers such as hospitals, these controls limited the increase in aggregate annual revenue to 6 percent to cover increases in costs. Increases in cost from wage and salary increases in excess of 5.5 percent a year, increases in nonlabor expenses of more than 2.5 percent a year, and expenditures for new technology exceeding 1.7 percent of total annual expenses were declared as nonallowable for purposes of raising prices. Application and enforcement of the regulations were plagued by problems resulting from interpretation, uncertainty from frequent rule changes, determination of base year and volume definitions, arbitrariness of price limiting factors, and the attempt to meet cost containment goals by using costs to justify price increases (Ginsburg, 1976). For example, a failure to distinguish between marginal and average costs (the latter exceeding the former in the short-run) created incentives for hospitals to increase admissions, patient days, and outpatient visits to enhance their reimbursement levels. Consequently, between 1972 and 1974, hospital inpatient days and admissions increased, and the decline in length of stay moderated (Salkever, 1979).[10]

Although indices of the rate of growth in hospital inflation declined during the period of ESP controls, a review of econometric investigations of the behavior of hospital costs by Salkever (1979) revealed mixed results. Two other studies failed to disclose a significant negative effect on average costs per case or day (Ginsburg, 1978) or the rate of hospital price inflation (Feldstein, 1977). However, studies by Lave and Lave (1978), Sloan and Steinwald (1979), and Salkever and Bice (1979) suggest that controls did effectively reduce the rate of hospital inflation. For providers such as physicians who were limited to aggregate weighted price increases of 2.5 percent for costs, evidence from analyses limited to California Medicare data suggests that controls were successful in limiting the rise in physician fees, although less successful in limiting expenditure increases (Holahan et al., 1979).

Certificate of Need

Certificate of need (CON) and Section 1122 review programs represent attempts to impose constraints on hospital capital expansion.[11] Analyses of these programs are plagued by various methodological and measurement problems, suggesting the need for future research using data that better reflect differences among CON programs and their outcome measures. Results of analyses to date are inconsistent regarding the effect of CON on investment components (i.e., beds, plant assets, and plant assets per bed), but they do seem to indicate that CON programs have not effectively constrained total hospital investment (Cohodes, 1980; Sloan and Steinwald, 1979; Salkever and Bice, 1979). Several analysts believe that hospital capital expansion activities might be more effectively curtailed by national technology assessment programs and coordination of health planning and rate regulatory activities.

Summary

The major points concerning current levels and patterns of health care expenditures are as follows:

- Health care expenditures are continuing their rapid rise, reaching $212.2 billion for 1979; this represents an increase of 12.5 percent over the previous fiscal year, and accounts for 9.0 percent of the gross national product.
- Medical care prices more than doubled from 1970 to 1979; price increases alone accounted

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[10] As Rafferty and Hornbrook (1979) demonstrated, the impact upon length of stay during the control period was the result of a shift to a more serious mix of cases typically requiring longer stays. Illness-specific lengths of stay continued to decline.

[11] Section 1122 of the Social Security Act as amended by Section 221 of the Social Security Amendments of 1972 (Public Law 92-603) established a program for State Planning Agency review of major capital expenditure projects (more than $100,000) by health care facilities. Participation by the States is voluntary, but it is mandatory for the health care facilities within participating States. As of January 1980, 30 States were participating. Interest and depreciation on unapproved projects are not reimbursed by the Medicare, Medicaid, or Maternal and Child Health programs.

for more than two-thirds of the increase in health expenditures in 1979.

- Hospital service charges have generally led the increase in medical care prices, with annual increases in excess of 10 percent during the period 1970 to 1979.
- Third-party payment for health care services has increased from 48 percent to 68 percent during the period 1965 to 1977. The proportion of the population with some form of health insurance coverage reached nearly 90 percent by 1977.
- Hospital labor intensity per patient day increased by 19 percent between 1971 and 1978.
- Hospital capital intensity per bed increased by 28 percent from 1971 to 1977; hospital real assets per 1,000 population increased 37 percent during this period.
- Occupation-specific, quality-adjusted wages in the health care sector rose relative to other industries until 1972, after which wages did not keep pace with other industries.
- Hospitals have markedly increased their reliance on debt financing of capital projects, from 35 percent in 1969 to 61 percent in 1978.
- From 1965 to 1978, the U.S. resident population increased by 12.7 percent to 218 million. The proportion of the population 65 years of age and over increased from 9.2 percent to 10.7 percent during the period 1960 to 1978.
- The number of physician visits per person per year increased from 4.5 in 1969 to 4.8 in 1978. Between 1965 and 1978, total discharges from short-stay hospitals per 1,000 population rose 8.5 percent.
- The average intensity of services per patient day in a community hospital rose by 55.4 percent during the period 1970 to 1979.
- Evidence on the evaluation of policies to control health care expenditures is mixed. Policies designed to encourage use through a reduction of financial barriers to access (Medicare and Medicaid) and through an increase in the supply of services (Hill-Burton Act of 1946, Health Professions Education Assistance Act of 1963) have been highly successful. Efforts to control costs through prospective reimbursement, direct wage and price controls, certificate of need, and utilization review have had marginal effects to date. However, the various methodological and measurement problems inherent in the early evaluations of cost containment efforts suggest the need for continuing research.

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Detailed Tables

Table 1. Live births, crude birth rates, and birth rates by age of mother, according to race: United States, selected years 1950-78

(Data are based on the national vital registration system)

Race and year	Live births	Crude birth rate[1]	10-14 years	15-19 years	20-24 years	25-29 years	30-34 years	35-39 years	40-44 years	45-49 years
			Age							
Total			Live births per 1,000 women							
1950	3,632,000	24.1	1.0	81.6	196.6	166.1	103.7	52.9	15.1	1.2
1955	4,097,000	25.0	0.9	90.3	241.6	190.2	116.0	58.6	16.1	1.0
1960	4,257,850	23.7	0.8	89.1	258.1	197.4	112.7	56.2	15.5	0.9
1965	3,760,358	19.4	0.8	70.5	195.3	161.6	94.4	46.2	12.8	0.8
1970	3,731,386	18.4	1.2	68.3	167.8	145.1	73.3	31.7	8.1	0.5
1975	3,144,198	14.8	1.3	56.3	114.7	110.3	53.1	19.4	4.6	0.3
1977	3,326,632	15.4	1.2	53.7	115.2	114.2	57.5	19.2	4.2	0.2
1978	3,333,279	15.3	1.2	52.4	112.3	112.0	59.1	18.9	3.9	0.2
White										
1950	3,108,000	23.0	0.4	70.0	190.4	165.1	102.6	51.4	14.5	1.0
1955	3,485,000	23.8	0.3	79.1	235.8	186.6	114.0	56.7	15.4	0.9
1960	3,600,744	22.7	0.4	79.4	252.8	194.9	109.6	54.0	14.7	0.8
1965	3,123,860	18.3	0.3	60.6	18[illegible].0	158.4	91.6	44.0	12.0	0.7
1970	3,091,264	17.4	0.5	57.4	163.4	145.9	71.9	30.0	7.5	0.4
1975	2,551,996	13.8	0.6	46.8	109.7	110.0	52.1	18.1	4.1	0.2
1977	2,691,070	14.4	0.6	44.6	109.8	113.8	56.3	17.8	3.8	0.2
1978	2,681,116	14.2	0.6	43.6	106.3	111.1	57.9	17.6	3.5	0.2
All other										
1950	524,000	33.3	5.1	163.5	242.6	173.8	112.6	64.3	21.2	2.6
1955	613,000	34.5	4.8	167.2	281.6	218.2	132.6	74.9	22.0	2.1
1960	657,106	32.1	4.0	158.2	294.2	214.6	135.6	74.2	22.0	1.7
1965	636,498	27.6	4.0	138.4	239.2	183.5	113.0	62.7	19.3	1.5
1970	640,122	25.1	4.8	133.4	196.8	140.1	82.5	42.2	12.6	0.9
1975	592,202	21.2	4.7	108.6	143.5	112.1	59.7	27.6	7.6	0.5
1977	635,562	21.9	4.3	102.4	145.7	116.5	64.8	27.5	6.9	0.5
1978	652,163	22.1	4.1	99.[illegible]	145.7	117.3	66.7	27.0	6.5	0.4
Black:										
1960	602,264	[illegible]	4.3	156.1	295.4	218.6	137.1	73.9	21.9	1.1
1965	581,126	27.5	4.3	144.6	243.1	180.4	111.3	61.9	18.7	1.4
1970	572,362	25.3	5.2	147.7	202.7	136.3	79.6	41.9	12.5	1.0
1975	511,581	20.9	5.1	113.8	145.1	105.4	54.1	25.4	7.5	0.5
1977	544,221	21.7	4.7	107.3	147.7	111.1	58.8	25.1	6.6	0.5
1978	551,540	21.6	4.4	103.7	147.5	110.6	59.3	24.0	6.0	0.4

[1] Live births per 1,000 population.

NOTE: Data are based on births adjusted for underregistration for 1950 and 1955 and on registered births for all other years. Figures for 1960, 1965, and 1970 are based on a 50-percent sample of births; for 1975-78, they are based on 100 percent of births in selected States and on a 50-percent sample of births in all other States. Beginning in 1970, births to nonresidents of the United States are excluded.

SOURCE: National Center for Health Statistics: *Vital Statistics of the United States, 1978,* Vol. 1. Public Health Service, DHHS, Hyattsville, Md. To be published.

Table 2. Birth rates for women 15-44 years of age, according to live-birth order and race: United States, selected years 1950-78

(Data are based on the national vital registration system)

Race and year	*Total*	*Live-birth order*				
		1	*2*	*3*	*4*	*5 and higher*
Total[1]		*Live births per 1,000 women 15-44 years of age*				
1950	106.2	33.3	32.1	18.4	9.2	13.2
1955	118.3	32.8	31.8	23.1	13.3	17.3
1960	118.0	31.1	29.2	22.8	14.6	20.3
1965	96.6	29.8	23.4	16.6	10.7	16.1
1970	87.9	34.2	24.2	13.6	7.2	8.7
1975	66.7	28.4	21.2	9.5	3.9	3.7
1977	67.8	28.6	21.9	10.1	3.9	3.3
1978	66.6	28.3	21.4	10.0	3.8	3.1
White						
1950	102.3	33.3	32.3	17.9	8.4	10.4
1955	113.7	32.6	32.0	22.9	12.6	13.6
1960	113.2	30.8	29.2	22.7	14.1	16.4
1965	91.4	28.9	23.0	15.2	10.2	13.1
1970	84.1	32.9	23.7	13.3	6.8	7.4
1975	63.0	26.9	20.5	8.9	3.6	3.1
1977	64.0	27.3	21.1	9.5	3.5	2.6
1978	62.7	27.0	20.5	9.3	3.4	2.5
Black						
1960	153.5	33.6	29.3	24.0	18.6	48.0
1965	133.9	35.7	26.2	19.4	14.6	38.0
1970	115.4	43.3	27.1	16.1	10.0	18.9
1975	89.2	37.4	24.6	12.8	6.3	8.1
1977	89.8	36.3	26.0	13.9	6.5	7.0
1978	88.6	35.3	25.9	14.[illegible]	6.7	6.6

[1] Includes all other races not shown separately.

NOTE: Beginning in 1970, births to nonresidents of the United States are excluded.

SOURCE: National Center for Health Statistics: *Vital Statistics of the United States, 1978*, Vol. 1. Public Health Service, DHHS, Hyattsville, Md. To be published.

Table 3. Completed fertility rates and parity distribution for women 50-54 years of age at the beginning of selected years 1925-79, according to color and birth cohort: United States, selected birth cohorts 1871-1929

(Data are based on the national vital registration system)

Color and birth cohort	Age 50-54 as of January 1	Completed fertility rate[1]	Total	Parity (number of children born alive)							
				0	1	2	3	4	5	6	7 or more
Total				Distribution of women[2]							
1871-75	1925	3,773.5	1,000.0	207.2	112.8	124.2	110.0	93.6	75.1	66.4	210.7
1876-80	1930	3,531.9	1,000.0	216.8	123.2	132.0	114.0	93.0	72.0	64.5	184.5
1881-85	1935	3,321.6	1,000.0	217.4	134.6	142.5	119.3	95.0	72.0	57.9	161.3
1886-90	1940	3,136.8	1,000.0	210.4	148.5	153.2	129.7	99.5	68.0	55.4	135.3
1891-95	1945	2,932.6	1,000.0	192.7	172.0	177.2	139.3	97.8	61.5	48.3	111.2
1896-1900	1950	2,675.9	1,000.0	194.6	200.7	195.2	136.6	87.8	53.5	41.5	90.1
1901-05	1955	2,441.4	1,000.0	201.9	227.6	206.2	129.3	80.4	48.6	34.7	71.3
1906-10	1960	2,285.8	1,000.0	215.6	225.1	218.7	131.4	77.5	44.6	29.2	57.9
1911-15	1965	2,354.3	1,000.0	190.1	208.6	238.1	149.8	85.2	46.3	28.8	53.1
1916-20	1970	2,574.0	1,000.0	149.0	179.0	251.7	174.6	102.8	55.8	32.0	55.1
1921-25	1975	2,856.9	1,000.0	108.5	152.1	248.7	197.0	123.5	68.0	39.5	62.7
1925-29	1979	3,041.1	1,000.0	104.9	121.1	231.6	207.5	139.5	79.2	45.8	70.4
White											
1871-75	1925	3,663.6	1,000.0	209.7	112.1	127.9	112.9	95.5	77.2	66.7	198.0
1876-80	1930	3,444.4	1,000.0	218.2	121.9	136.1	116.9	94.8	74.0	64.2	173.9
1881-85	1935	3,253.8	1,000.0	217.6	132.2	147.9	122.4	96.0	74.2	57.8	151.9
1886-90	1940	3,092.9	1,000.0	209.1	144.3	160.3	132.4	100.2	70.3	54.8	128.6
1891-95	1945	2,890.4	1,000.0	191.7	167.5	184.6	141.4	98.0	64.2	47.8	104.8
1896-1900	1950	2,631.5	1,000.0	193.1	192.1	205.9	141.4	89.0	55.2	41.1	82.2
1901-05	1955	2,399.0	1,000.0	197.9	219.5	218.3	135.8	82.3	49.4	33.7	63.1
1906-10	1960	2,248.9	1,000.0	207.9	218.0	233.2	138.8	79.6	44.7	28.0	49.8
1911-15	1965	2,313.5	1,000.0	177.4	204.9	254.1	158.9	88.0	46.1	27.4	43.2
1916-20	1970	2,526.7	1,000.0	134.6	175.9	268.7	185.1	106.5	55.3	30.3	43.6
1921-25	1975	2,793.7	1,000.0	94.2	150.6	264.6	208.8	127.9	67.9	36.9	49.1
1925-29	1979	2,951.1	1,000.0	93.4	121.3	245.4	220.1	144.3	78.5	43.1	53.9
All other											
1871-75	1925	4,770.8	1,000.0	185.7	118.2	93.6	82.0	76.4	56.1	65.3	322.7
1876-80	1930	4,254.7	1,000.0	207.7	134.0	99.5	87.4	79.9	54.7	64.8	272.0
1881-85	1935	3,865.0	1,000.0	223.1	151.5	99.8	96.5	85.3	41.5	64.1	238.2
1886-90	1940	3,451.4	1,000.0	231.9	175.9	105.9	96.6	93.3	52.4	58.0	186.0
1891-95	1945	3,212.5	1,000.0	222.3	206.7	112.4	114.5	92.6	40.4	48.4	152.7
1896-1900	1950	2,967.7	1,000.0	227.4	255.0	114.1	97.5	74.3	38.8	42.6	150.3
1901-05	1955	2,706.7	1,000.0	250.4	275.9	117.8	81.0	62.3	43.0	39.1	130.5
1906-10	1960	2,529.1	1,000.0	287.5	266.6	114.5	73.2	60.1	43.5	35.6	119.0
1911-15	1965	2,641.2	1,000.0	296.1	232.4	116.3	78.3	64.1	46.1	38.9	127.8
1916-20	1970	2,924.2	1,000.0	266.2	202.0	120.9	91.2	72.5	57.8	44.9	144.5
1921-25	1975	3,315.9	1,000.0	217.7	163.5	131.7	108.2	89.0	68.7	56.4	164.8
1925-29	1979	3,666.7	1,000.0	188.9	120.9	132.0	118.7	103.8	83.0	66.7	186.0

[1] Number of children born alive to each 1,000 women who have completed their reproductive histories (women 50-54 years of age).

[2] Proportional distribution of each 1,000 women in the cohort by the number of children born alive to them.

NOTE: Example of use of table—For every 1,000 women 50-54 years of age in 1979, an average of 3,041.1 children were born alive (about 3 children per woman). About 10 percent of the women in this cohort reached 50-54 years of age having had no children, about 12 percent had 1 child, and about 11 percent had 6 children or more.

SOURCES: National Center for Health Statistics: *Fertility Tables for Birth Cohorts by Color, United States, 1917-73*, by R. Heuser. DHEW Pub. No. (HRA) 76-1152. Health Resources Administration. Washington. U.S. Government Printing Office, Apr. 1976; Data computed from *Vital Statistics of the United States, 1978*, Vol. 1. Public Health Service, DHHS, Hyattsville, Md. To be published.

Table 4. Selected measures of teenage fertility, according to age and race: United States, 1968-78

(Data are based on the national vital registration system)

Race and year	Age									
	10-14 years	*15-17 years*	*18-19 years*	*10-14 years*	*15-17 years*	*18-19 years*	*15-17 years*	*18-19 years*	*15-17 years*	*18-19 years*
	Live births per 1,000 women			*Percent of all live births*			*Live births to unmarried women per 1,000 unmarried women*		*Live births to unmarried women per 1,000 total live births*	
Total[1]										
1968	1.0	35.1	113.5	0.3	5.5	11.4	14.7	30.0	403.7	201.3
1969	1.0	35.7	112.4	0.3	5.6	11.2	15.2	31.5	412.8	210.7
1970	1.2	38.8	114.7	0.3	6.0	11.3	17.1	32.9	429.8	223.9
1971	1.1	38.3	105.6	0.3	6.4	11.3	17.6	31.7	445.4	232.0
1972	1.2	39.2	97.3	0.4	7.3	11.7	18.6	31.0	458.5	246.8
1973	1.3	38.9	91.8	0.4	7.6	11.7	18.9	30.6	466.9	255.7
1974	1.2	37.7	89.3	0.4	7.4	11.4	19.0	31.4	482.5	270.4
1975	1.3	36.6	85.7	0.4	7.2	11.3	19.5	32.8	513.9	298.1
1976	1.2	34.6	81.3	0.4	6.8	10.8	19.3	32.5	540.2	316.1
1977	1.2	34.5	81.9	0.3	6.4	10.4	20.1	35.0	565.5	343.7
1978	1.2	32.9	81.0	0.3	6.1	10.2	19.5	35.7	574.9	361.6
White										
1968	0.4	25.6	100.5	0.1	4.2	10.5	6.2	16.8	234.4	127.4
1969	0.4	26.4	99.2	0.1	4.3	10.2	6.6	17.0	240.3	129.0
1970	0.5	29.2	101.5	0.1	4.6	10.4	7.5	17.6	252.0	135.0
1971	0.5	28.6	92.4	0.1	4.9	10.4	7.4	15.9	251.7	131.7
1972	0.5	29.4	34.5	0.2	5.7	10.7	8.7	15.1	264.4	136.7
1973	0.6	29.5	79.6	0.2	6.0	10.6	8.5	15.0	276.4	142.6
1974	0.6	29.0	77.7	0.2	5.9	10.4	8.9	15.4	294.2	150.1
1975	0.6	28.3	74.4	0.2	5.8	10.3	9.7	16.6	329.6	171.9
1976	0.6	26.7	70.7	0.2	5.4	9.9	9.9	17.0	357.4	187.9
1977	0.6	26.5	71.1	0.2	5.1	9.4	10.7	18.8	389.2	209.5
1978	0.6	25.4	70.1	0.2	4.9	9.3	10.5	19.5	400.9	224.4
Black										
1968	4.7	98.2	206.1	1.2	13.1	16.6	---	---	---	---
1969	4.8	96.9	202.5	1.2	13.1	16.7	72.3	129.1	720.9	482.9
1970	5.2	101.4	204.9	1.3	13.4	16.6	77.9	136.4	759.6	521.4
1971	5.1	99.7	193.8	1.3	14.0	16.4	80.9	136.3	796.3	[illegible]
1972	5.1	99.9	181.7	1.4	15.5	17.0	82.9	129.8	810.1	590.2
1973	5.4	96.8	169.5	1.5	15.8	17.1	81.9	123.0	825.6	603.8
1974	5.0	91.0	162.0	1.4	15.4	17.1	79.4	124.9	848.0	638.3
1975	5.1	86.6	156.0	1.4	14.6	16.8	77.7	126.8	874.0	676.0
1976	4.7	81.5	146.8	1.3	13.9	16.0	74.6	121.6	897.4	709.0
1977	4.7	81.2	147.6	1.2	13.1	15.4	74.3	125.9	904.7	746.4
1978	4.4	76.6	145.0	1.1	12.2	15.2	70.3	124.3	909.1	764.8

[1] Includes all other races not shown separately.

NOTE: Beginning in 1970, births to nonresidents of the United States are excluded.

SOURCE: Division of Vital Statistics, National Center for Health Statistics: Selected data.

Table 5. Legal abortions, according to selected patient characteristics, type of procedure, and location of facility: United States, 1973-78

(Data are based on reporting by State health departments and by facilities)

Characteristic	*Year*					
	1973	*1974*	*1975*	*1976*	*1977*	*1978*
			Number of legal abortions reported			
Center for Disease Control	615,831	763,476	854,853	988,267	1,079,430	1,157,776
Alan Guttmacher Institute	744,600	898,600	1,034,200	1,179,300	1,320,000	1,409,600
			Percent distribution			
Total	100.0	100.0	100.0	100.0	100.0	100.0
Age						
Under 20 years	32.7	32.7	33.1	32.1	30.8	30.0
20-24 years	32.0	31.8	31.9	33.3	34.5	35.0
25 years and over	35.3	35.6	35.0	34.6	34.7	34.9
Color						
White	72.5	69.7	67.8	66.6	66.4	67.0
All other	27.5	30.3	32.2	33.4	33.6	33.0
Marital status						
Married	27.4	27.4	26.1	24.6	24.3	26.4
Unmarried	72.6	72.6	73.9	75.4	75.7	73.6
Number of living children						
0	46.6	47.8	47.1	47.7	53.4	56.6
1	18.8	19.6	20.2	20.7	19.1	19.2
2	14.2	14.8	15.5	15.4	14.4	14.1
3	8.7	8.7	8.7	8.3	7.0	5.9
4	4.8	4.5	4.4	4.1	3.3	4.2
5 or more	4.9	4.5	4.2	3.8	2.9	
Period of gestation						
Under 9 weeks	36.1	42.6	44.6	47.0	51.2	52.2
9-10 weeks	29.4	28.7	28.4	28.0	27.2	26.9
11-12 weeks	17.9	15.4	14.9	14.4	13.1	12.3
13-15 weeks	6.9	5.5	5.0	4.5	3.4	4.0
16-20 weeks	8.0	6.5	6.1	5.1	4.3	3.7
21 weeks and over	1.7	1.2	1.0	0.9	0.9	0.9
Type of procedure						
Curettage	88.4	89.7	90.9	92.8	93.8	94.6
Intrauterine instillation	10.4	7.8	6.2	6.0	5.4	3.9
Hysterotomy or hysterectomy	0.7	0.6	0.4	0.2	0.2	0.1
Other	0.6	1.9	2.4	0.9	0.7	1.4
Location of facility						
In State of residence	74.8	86.6	89.2	90.0	90.0	89.3
Out of State of residence	25.2	13.4	10.8	10.0	10.0	10.7

NOTE: Percent distributions exclude cases for which selected characteristic was unknown and are based on abortions reported to the Center for Disease Control.

SOURCES: Center for Disease Control: *Abortion Surveillance, 1976.* DHEW Pub. No. (CDC) 78-8205. Public Health Service. Washington. U.S. Government Printing Office, Apr. 1978, *Abortion Surveillance, 1977.* Public Health Service, DHEW, Atlanta, Ga., Sept. 1979, and *Abortion Surveillance, 1978.* Public Health Service, DHHS, Atlanta, Ga. To be published; Sullivan, E., Tietze, C., and Dryfoos, J.: Legal abortions in the United States, 1975-1976. *Fam. Plann. Perspect.* 9(3):116-129, May-June 1977; The Alan Guttmacher Institute: Personal communication, 1980.

Table 6. Legal abortions, abortion-related deaths and death rates, and relative risk of death, according to period of gestation: United States, 1973-75 and 1976-78

(Data are based primarily on reporting by State health departments and by facilities)

Year and period of gestation	Number of legal abortions reported	Abortion-related deaths		Relative risk of death[1]
		Number	Rate per 100,000 abortions	
1973-75				
Total	2,234,160	79	3.5	
Under 9 weeks	928,814	6	0.6	1.0
9-10 weeks	642,884	14	2.2	3.7
11-12 weeks	355,217	12	3.4	5.7
13-15 weeks	127,606	9	7.1	11.8
16-20 weeks	150,754	31	20.6	34.3
21 weeks and over	28,885	7	24.2	40.3
1976-78				
Total	3,225,473	33	1.0	
Under 9 weeks	1,620,840	5	0.3	1.0
9-10 weeks	882,051	6	0.7	2.3
11-12 weeks	425,744	2	0.5	1.7
13-15 weeks	127,890	8	6.3	21.0
16-20 weeks	139,587	10	7.2	24.0
21 weeks and over	29,361	2	6.8	22.7

[1] Relative risk based on the index rate of 0.6 for 1973-75 and 0.3 for 1976-78 for the gestation period under 9 weeks.

SOURCE: Center for Disease Control: *Abortion Surveillance, 1978.* Public Health Service, DHHS, Atlanta, Ga. To be published.

Table 7. Ever-married women 15-44 years of age and percent distribution by contraceptive status and method of contraception used, according to labor force status, race, and age: United States, 1973 and 1976

(Data are based on household interviews of samples of ever-married women in the childbearing ages)

Labor force status, race, and age	Number of ever-married women in thousands		Percent of ever-married women using contraception		Method of contraception											
					Total	Female sterilization		Male sterilization[1]		Birth control pill		Intrauterine device		Other[2]	
	1973	1976	1973	1976		1973	1976	1973	1976	1973	1976	1973	1976	1973	1976
IN LABOR FORCE															
					Percent distribution										
Total[3]															
15-44 years	13,284	16,307	65.8	66.9	100.0	13.0	14.5	9.0	11.6	41.4	38.0	10.1	9.8	26.5	26.1
15-24 years	2,921	3,340	75.3	74.2	100.0	*2.5	*2.6	·0.8	*0.9	72.4	65.6	*9.8	9.1	14.6	21.8
25-34 years	5,212	6,847	67.0	69.9	100.0	9.6	15.0	9.5	10.8	42.1	40.0	13.1	11.3	25.7	22.9
35-44 years	5,151	6,120	59.4	59.5	100.0	24.4	21.8	14.2	20.2	18.3	16.5	7.0	8.2	36.1	33.3
White															
15-44 years	11,474	14,071	67.4	68.5	100.0	11.6	14.1	10.0	12.6	41.4	37.5	9.8	9.7	27.4	26.1
15-24 years	2,616	2,980	75.0	76.1	100.0	*2.2	*2.6	*0.9	*1.0	71.8	65.3	*9.5	9.0	15.6	22.1
25-34 years	4,487	5,838	68.4	71.2	100.0	9.0	15.3	10.5	11.9	42.0	38.7	12.3	11.3	26.2	22.7
35-44 years	4,372	5,253	61.7	61.1	100.0	21.3	20.7	15.9	21.8	18.5	16.0	6.9	8.0	37.3	33.5
Black															
15-44 years	1,661	1,979	57.3	58.4	100.0	23.8	18.5	*1.1	*2.8	42.8	42.6	13.7	11.3	18.6	24.8
15-24 years	301	321	78.9	59.4	100.0	4.4	*2.8	*0.0	*0.4	77.5	71.2	12.0	*8.9	*6.0	*16.5
25-34 years	656	874	58.4	64.4	100.0	15.4	14.9	*1.6	*0.5	44.2	49.0	*9.4	12.8	19.4	22.9
35-44 years	704	784	47.0	51.4	100.0	47.5	31.0	*1.2	*7.0	16.1	20.1	[illegible]	10.4	26.8	31.5
NOT IN LABOR FORCE															
Total[3]															
15-44 years	16,963	15,481	66.9	64.7	100.0	14.1	16.3	11.4	12.1	32.9	30.8	10.2	10.1	31.5	30.7
15-24 years	3,672	3,342	60.3	62.3	100.0	*6.2	5.3	*3.3	*1.8	58.2	62.0	*11.8	9.9	20.5	21.1
25-34 years	7,519	7,257	72.7	69.2	100.0	13.7	16.5	10.9	10.7	32.4	29.7	13.3	11.4	29.8	31.6
35-44 years	5,772	4,882	63.4	59.6	100.0	19.5	23.3	17.2	22.0	18.3	10.2	*4.4	8.1	40.6	35.9

See footnotes at end of table.

Table 7. Ever-married women 15-44 years of age and percent distribution by contraceptive status and method of contraception used, according to labor force status, race, and age: United States, 1973 and 1976—Continued

(Data are based on household interviews of samples of ever-married women in the childbearing ages)

Labor force status, race, and age	Number of ever-married women in thousands		Percent of ever-married women using contraception		Method of contraception										
					Total	Female sterilization		Male sterilization[1]		Birth control pill		Intrauterine device		Other[2]	
	1973	*1976*	*1973*	*1976*		*1973*	*1976*	*1973*	*1976*	*1973*	*1976*	*1973*	*1976*	*1973*	*1976*
NOT IN LABOR FORCE—Con.															
					Percent distribution										
White															
15-44 years	15,321	13,800	68.1	65.9	100.0	13.1	15.5	12.2	13.2	32.2	30.8	9.9	9.7	32.6	30.7
15-24 years	3,240	2,933	60.8	63.1	100.0	*6.0	*4.7	*3.7	*2.0	57.1	62.9	*11.8	9.6	21.4	20.8
25-34 years	6,869	6,500	73.7	70.7	100.0	12.9	15.7	11.4	11.6	32.1	30.0	13.0	10.8	30.6	31.8
35-44 years	5,212	4,366	65.1	60.6	100.0	17.6	22.7	18.2	24.0	18.0	9.7	*4.2	7.7	42.0	35.8
Black															
15-44 years	1,448	1,334	54.0	54.2	100.0	27.4	27.3	1.4	0.8	40.5	30.8	14.0	14.5	16.6	26.7
15-24 years	391	343	54.6	58.9	100.0	*9.3	*11.2	*0.2	*0.4	66.8	51.4	13.3	*13.0	10.4	24.0
25-34 years	571	550	60.0	55.8	100.0	25.8	26.8	2.5	*0.3	38.6	31.3	18.2	14.9	14.9	26.7
35-44 years	487	441	46.5	48.6	100.0	46.8	43.0	*0.9	*1.9	18.8	*10.8	*8.4	*15.2	25.1	29.1

[1] Refers only to currently married couples.

[2] Other methods include diaphragm, condom, foam, rhythm, withdrawal, and douche.

[3] Includes all other races not shown separately.

SOURCE: Division of Vital Statistics, National Center for Health Statistics: Data from the National Survey of Family Growth.

Table 8. Death rates for all causes, according to race, sex, and age: United States, selected years 1950-77

(Data are based on the national vital registration system)

Race, sex, and age	1950	1955	1960	1965	1970[1]	1975[1]	1976[1]	1977[1]
Total[2]	Number of deaths per 100,000 resident population							
All ages, age adjusted[3]	841.5	764.6	760.9	739.0	714.3	638.3	627.5	612.3
All ages, crude	963.8	930.4	954.7	944.6	945.3	888.5	889.6	878.1
Under 1 year	754.6	2,848.5	2,696.4	2,463.3	2,142.4	1,641.0	1,595.0	1,485.6
1-4 years		113.4	109.1	95.9	84.5	70.8	69.9	68.8
5-9 years	61.7	50.6	49.0	43.9	42.1	35.7	34.8	34.0
10-14 years	58.1	46.6	44.0	40.5	40.6	35.7	34.6	35.1
15-19 years	108.6	97.3	92.2	95.3	110.3	101.5	97.1	101.6
20-24 years	146.0	134.9	123.6	126.6	148.0	138.2	131.3	133.5
25-29 years	159.3	135.5	130.8	134.0	144.2	136.7	129.3	132.1
30-34 years	199.4	163.0	160.7	167.9	172.9	151.0	144.8	140.9
35-39 years	283.7	238.6	233.6	242.4	247.1	209.6	198.4	195.5
40-44 years	441.3	379.8	370.2	370.0	377.0	326.1	313.4	304.7
45-49 years	682.2	592.4	590.9	583.3	584.1	512.4	498.1	482.3
50-54 years	1,042.2	947.1	943.1	924.0	889.3	784.6	767.7	754.7
55-59 years	1,562.3	1,406.5	1,385.0	1,334.9	1,361.0	1,199.8	1,175.0	1,138.1
60-64 years	2,329.0	2,097.8	2,148.3	2,120.9	2,003.5	1,832.7	1,822.8	1,784.9
65-69 years	3,328.2	3,168.2	3,141.7	3,045.3	2,969.2	2,574.7	2,541.5	2,480.4
70-74 years	5,152.0	4,695.1	4,720.6	4,420.6	4,370.8	4,050.5	3,948.3	3,847.1
75-79 years	7,979.3	7,367.2	7,204.0	6,980.3	6,721.8	6,205.1	6,186.7	6,073.0
80-84 years	11,840.8	11,467.0	11,724.0	10,814.6	10,157.8	9,102.6	9,034.4	8,814.7
85 years and over	20,193.4	18,983.3	19,857.5	20,069.0	16,344.9	15,187.9	15,486.9	14,725.9
White male								
All ages, age adjusted[3]	963.1	905.0	917.7	911.1	893.4	812.7	798.8	781.5
All ages, crude	1,089.5	1,069.6	1,098.5	1,087.6	1,086.7	1,015.3	1,010.4	998.2
Under 1 year	766.4	2,877.9	2,694.1	2,409.0	2,113.2	1,594.4	1,511.8	1,429.7
1-4 years		109.6	104.9	91.5	83.6	71.3	71.9	69.7
5-9 years	67.3	56.7	53.7	47.5	47.5	39.4	38.3	38.4
10-14 years	67.1	56.4	51.6	48.7	48.5	43.3	42.8	42.5
15-19 years	130.5	132.1	125.2	130.8	147.1	144.5	138.1	145.8
20-24 years	173.0	182.5	166.9	171.0	199.0	189.5	182.4	190.0
25-29 years	170.1	158.0	152.1	157.3	169.2	168.9	159.8	167.3
30-34 years	201.1	176.2	173.2	178.3	185.4	169.5	164.2	164.2
35-39 years	293.4	258.5	253.4	258.3	260.4	230.2	219.2	219.3
40-44 years	475.6	423.2	417.0	411.5	420.0	363.5	352.2	339.7
45-49 years	773.7	700.4	709.3	687.1	684.6	606.0	586.6	565.1
50-54 years	1,213.6	1,154.9	1,183.3	1,157.1	1,098.6	971.3	940.9	925.4
55-59 years	1,881.4	1,760.8	1,784.6	1,751.5	1,774.6	1,534.6	1,496.4	1,440.0
60-64 years	2,805.7	2,645.5	2,751.4	2,801.2	2,708.4	2,443.7	2,407.9	2,338.0
65-69 years	4,067.0	3,964.8	4,050.7	4,061.8	4,046.1	3,590.9	3,542.9	3,436.4
70-74 years	6,038.3	5,720.5	5,909.2	5,778.8	5,828.0	5,462.2	5,340.8	5,233.9
75-79 years	9,060.0	8,649.8	8,698.7	8,741.9	8,693.4	8,253.6	8,246.8	8,104.6
80-84 years	13,369.7	13,292.3	13,544.3	13,073.5	12,606.8	11,832.0	11,774.4	11,597.5
85 years and over	22,132.6	20,063.6	21,750.0	22,733.6	18,551.7	18,257.9	18,767.6	18,041.7

See footnotes at end of table.

Table 8. Death rates for all causes, according to race, sex, and age: United States, selected years 1950-77—Continued

(Data are based on the national vital registration system)

Race, sex, and age	*Year*							
	1950	*1955*	*1960*	*1965*	*1970*[1]	*1975*[1]	*1976*[1]	*1977*[1]
White female	*Number of deaths per 100,000 resident population*							
All ages, age adjusted[3]	645.0	572.8	555.0	527.6	501.7	445.3	439.6	427.8
All ages, crude	803.3	777.4	801.0	800.8	812.6	783.8	793.6	783.3
Under 1 year	586.5	2,167.5	2,007.7	1,801.3	1,614.6	1,222.3	1,192.1	1,094.8
1-4 years		90.3	85.2	74.6	66.1	57.1	55.9	55.0
5-9 years	48.2	39.0	38.3	33.8	32.0	27.5	26.9	25.6
10-14 years	41.3	31.8	30.8	28.0	27.9	24.4	24.2	25.0
15-19 years	62.3	53.9	50.3	50.1	57.8	52.4	52.6	55.2
20-24 years	79.8	64.7	60.4	63.1	65.7	59.8	57.0	59.3
25-29 years	97.4	74.1	71.6	70.6	73.1	64.1	61.8	61.4
30-34 years	128.9	101.0	97.1	101.6	97.2	84.3	80.9	78.3
35-39 years	187.8	154.7	147.5	150.8	150.9	124.0	119.2	115.6
40-44 years	288.8	246.8	237.9	235.7	232.0	206.9	194.0	191.7
45-49 years	443.5	369.2	368.5	376.1	373.6	326.6	319.0	309.7
50-54 years	657.8	575.9	560.3	567.4	559.5	499.7	488.4	480.1
55-59 years	1,017.6	879.6	829.7	799.8	830.8	761.6	751.0	726.2
60-64 years	1,621.1	1,385.7	1,362.2	1,281.8	1,222.9	1,149.5	1,157.7	1,144.0
65-69 years	2,520.9	2,304.4	2,154.9	2,025.9	1,924.5	1,662.7	1,651.5	1,632.7
70-74 years	4,265.2	3,718.0	3,583.2	3,231.3	3,134.1	2,798.8	2,721.9	2,634.6
75-79 years	7,048.3	6,396.3	6,084.2	5,697.3	5,349.8	4,801.8	4,745.3	4,603.3
80-84 years	11,061.8	10,528.4	10,654.3	9,387.5	8,869.4	7,813.5	7,743.4	7,494.9
85 years and over	19,676.8	19,156.1	19,477.7	19,353.7	15,980.2	14,494.1	14,823.3	14,039.7
All other male[4]								
All ages, age adjusted[3]	1,358.5	1,187.5	1,211.0	1,217.2	1,231.4	1,097.5	1,072.1	1,045.9
All ages, crude	1,251.1	1,133.3	1,152.0	1,121.3	1,115.9	999.1	983.5	967.1
Under 1 year	1,438.8	5,348.3	5,189.4	4,871.1	4,020.0	3,001.1	3,012.4	2,780.4
1-4 years		212.2	207.3	178.3	144.7	108.8	107.5	108.1
5-9 years	98.2	77.2	72.3	70.4	62.2	55.9	54.8	51.6
10-14 years	95.8	75.5	78.8	65.0	67.8	57.4	49.9	53.9
15-19 years	216.6	168.6	165.8	172.8	224.0	164.3	149.8	145.0
20-24 years	365.4	316.0	274.9	292.0	415.5	340.7	300.1	276.6
25-29 years	429.4	379.9	343.0	392.2	456.6	435.8	389.9	382.0
30-34 years	573.0	430.6	428.6	458.4	558.8	477.1	436.6	415.1
35-39 years	702.0	566.4	599.2	662.8	723.7	630.8	580.5	560.8
40-44 years	1,039.0	880.4	876.5	948.6	1,024.3	844.7	811.3	793.0
45-49 years	1,458.5	1,311.5	1,241.5	1,324.6	1,395.1	1,166.4	1,138.3	1,100.8
50-54 years	2,332.7	1,889.0	1,916.2	1,887.4	1,935.3	1,690.0	1,683.3	1,624.2
55-59 years	3,266.3	2,693.7	2,500.5	2,492.6	2,639.5	2,392.8	2,352.8	2,310.8
60-64 years	4,274.0	3,874.9	4,053.8	3,940.8	3,534.4	3,280.8	3,371.4	3,360.1
65-69 years	4,605.4	4,580.3	5,103.7	4,853.1	4,759.2	4,036.7	3,963.4	3,795.2
70-74 years	6,340.5	6,088.5	6,493.2	6,433.9	6,557.3	6,534.9	6,394.1	6,196.1
75-79 years	8,864.1	7,169.9	7,628.0	8,180.5	8,483.1	8,254.3	8,428.5	8,650.4
80-84 years	9,291.9	9,695.2	11,017.4	9,725.4	9,855.8	9,167.4	9,010.0	8,986.0
85 years and over	15,742.1	13,766.7	15,238.7	15,761.8	11,405.2	11,693.8	11,519.1	11,286.1

See footnotes at end of table.

Table 8. Death rates for all causes, according to race, sex, and age: United States, selected years 1950-77—Continued

(Data are based on the national vital registration system)

Race, sex, and age	1950	1955	1960	1965	1970[1]	1975[1]	1976[1]	1977[1]
Black male:			Number of deaths per 100,000 resident population					
All ages, age adjusted[3]	1,373.1	—	1,246.1	1,270.3	1,318.6	1,174.3	1,151.1	1,127.6
All ages, crude	1,260.3	—	1,181.7	1,163.0	1,186.6	1,064.0	1,051.8	1,037.0
Under 1 year	1,412.6	—	5,306.8	5,039.9	4,298.9	3,253.5	3,282.8	3,038.7
1-4 years		—	208.5	182.3	150.5	114.6	112.9	113.6
5-9 years	95.3	—	71.9	72.0	65.1	57.6	57.0	53.6
10-14 years	94.8	—	79.2	65.8	63.8	57.1	50.7	55.7
15-19 years	216.0	—	165.5	176.6	230.9	167.4	147.3	143.0
20-24 years	366.9	—	271.8	300.0	448.8	357.3	316.7	287.2
25-29 years	433.5	—	356.3	404.4	505.4	476.8	422.3	412.8
30-34 years	583.1	—	447.4	489.4	622.3	531.4	486.5	465.8
35-39 years	713.0	—	627.9	704.9	794.9	671.2	629.0	610.0
40-44 years	1,066.0	—	912.3	1,007.3	1,117.3	924.4	883.9	862.9
45-49 years	1,496.2	—	1,296.7	1,395.9	1,514.9	1,270.2	1,240.1	1,206.2
50-54 years	2,393.2	—	2,016.7	1,986.4	2,075.3	1,822.9	1,828.0	1,765.1
55-59 years	3,325.3	—	2,664.5	2,633.8	2,825.8	2,548.0	2,522.4	2,472.3
60-64 years	4,382.7	—	4,199.6	4,226.9	3,778.7	3,466.3	3,569.3	3,565.0
65-69 years	4,668.8	—	5,226.5	5,039.8	5,051.3	4,201.5	4,118.2	3,937.4
70-74 years	6,436.0	—	6,664.5	6,559.0	6,936.6	7,045.5	6,932.8	6,699.0
75-79 years	10,101.9	—	7,653.7	8,461.4	8,827.8	9,080.2	9,426.9	9,886.7
80-84 years		—	10,757.1	9,919.6	10,629.9	9,738.7	9,555.1	9,853.8
85 years and over		—	14,844.8	15,966.7	12,222.3	12,450.9	12,375.0	12,030.0
All other female[5]								
All ages, age adjusted[3]	1,095.7	909.9	893.3	831.4	770.8	648.3	635.1	621.3
All ages, crude	993.5	875.9	872.6	822.6	775.3	682.5	680.0	672.5
Under 1 year	1,163.0	4,282.1	4,067.1	3,872.7	3,169.4	2,523.0	2,542.2	2,304.5
1-4 years		185.7	174.4	156.7	123.3	93.0	86.1	87.1
5-9 years	80.1	61.1	61.0	54.5	46.0	36.8	35.4	34.3
10-14 years	69.1	48.6	44.2	40.2	38.6	31.6	29.0	28.0
15-19 years	176.6	91.2	80.4	80.2	84.7	65.4	56.9	62.8
20-24 years	253.9	164.5	135.8	121.6	138.1	110.7	107.2	99.1
25-29 years	330.9	234.0	210.2	189.2	185.2	141.7	139.3	131.7
30-34 years	457.2	322.2	307.8	288.0	250.0	183.4	180.7	165.6
35-39 years	613.6	477.6	448.1	435.6	395.7	288.9	261.8	256.1
40-44 years	924.4	686.4	660.8	637.7	586.3	434.7	426.1	404.1
45-49 years	1,246.8	1,051.4	919.4	870.5	829.0	657.8	625.6	599.7
50-54 years	1,940.7	1,567.9	1,419.5	1,246.4	1,153.0	914.1	928.6	914.5
55-59 years	2,630.0	2,109.9	1,951.8	1,677.8	1,606.4	1,367.4	1,312.6	1,307.5
60-64 years	3,579.3	2,872.4	3,019.5	2,849.3	2,218.8	1,939.0	1,917.0	1,895.0
65-69 years	3,346.8	3,348.5	3,474.4	3,206.2	3,129.5	2,331.0	2,229.2	2,176.1
70-74 years	5,153.9	4,472.4	4,742.5	4,257.2	4,488.4	4,667.0	4,452.1	4,298.6
75-79 years	7,014.5	6,156.8	5,879.2	5,714.0	5,782.2	5,832.0	6,132.6	6,450.8
80-84 years	7,220.0	6,892.2	8,477.5	7,868.8	7,421.5	6,180.9	6,333.6	6,265.0
85 years and over	13,426.9	11,214.7	12,871.2	12,998.0	10,288.9	9,177.3	9,175.2	8,673.5

See footnotes at end of table.

Table 8. Death rates for all causes, according to race, sex, and age: United States, selected years 1950-77—Continued

(Data are based on the national vital registration system)

Race, sex, and age	Year							
	1950	*1955*	*1960*	*1965*	*1970*[1]	*1975*[1]	*1976*[1]	*1977*[1]
Black female:				*Number of deaths per 100,000 resident population*				
All ages, age adjusted[3]	1,106.7	—	916.9	859.9	814.4	688.4	676.4	664.4
All ages, crude	1,002.0	—	905.0	860.3	829.2	735.5	735.7	730.6
Under 1 year	1,139.3	—	4,162.2	4,001.1	3,368.8	2,740.3	2,738.1	2,509.6
1-4 years		—	173.3	159.3	129.4	96.9	92.1	91.0
5-9 years	78.2	—	61.8	56.2	47.6	37.7	37.0	35.6
10-14 years	66.6	—	44.1	40.2	40.1	31.7	29.0	28.3
15-19 years	172.7	—	81.3	81.0	86.2	65.8	57.3	62.0
20-24 years	251.3	—	138.1	125.5	144.1	115.1	110.7	102.7
25-29 years	330.5	—	220.6	195.9	198.3	150.8	150.5	143.8
30-34 years	463.6	—	323.5	304.6	267.8	196.8	196.3	178.2
35-39 years	615.7	—	467.3	457.9	428.4	308.7	278.0	275.8
40-44 years	930.1	—	682.5	668.3	637.6	473.4	456.9	440.6
45-49 years	1,262.7	—	943.4	908.4	887.0	715.5	687.6	658.4
50-54 years	1,969.8	—	1,460.5	1,288.6	1,222.0	990.8	1,009.0	998.5
55-59 years	2,674.4	—	2,051.1	1,739.7	1,688.5	1,454.8	1,396.0	1,397.3
60-64 years	3,633.3	—	3,113.2	2,992.2	2,335.8	2,019.6	2,005.7	1,987.4
65-69 years	3,363.2	—	3,551.9	3,324.4	3,285.3	2,387.6	2,281.3	2,234.5
70-74 years	5,201.2	—	4,832.6	4,351.9	4,728.5	5,025.3	4,803.8	4,606.8
75-79 years	8,347.0	—	5,931.2	5,869.3	6,059.7	6,390.4	6,800.6	7,271.0
80-84 years		—	8,437.3	7,926.0	7,761.0	6,472.9	6,698.4	6,618.5
85 years and over		—	13,052.6	13,143.5	10,706.6	9,558.6	9,554.1	9,035.3

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[1] Excludes deaths of nonresidents of the United States.

[2] Includes all races and both sexes.

[3] Age adjusted by the direct method to the total population of the United States as enumerated in 1940, using 11 age groups.

[4] Includes black males.

[5] Includes black females.

SOURCES: National Center for Health Statistics: *Vital Statistics of the United States*, Vol. II, 1950-77. Public Health Service. Washington. U.S. Government Printing Office; Data computed by the Division of Analysis from data compiled by the Division of Vital Statistics; U.S. Bureau of the Census: Population estimates and projections. *Current Population Reports.* Series P-25, Nos. 310, 519, 643, and 721. Washington. U.S. Government Printing Office, June 1965, Apr. 1974, Jan. 1977, and Apr. 1978; *1950 Nonwhite Population by Race*, Special report P-E No. 3B. Washington. U.S. Government Printing Office, 1951; General population characteristics, United States summary, 1960 and 1970. *U.S. Census of Population.* Final reports PC(1)-1B and PC(1)-B1. Washington. U.S. Government Printing Office, 1961 and 1972.

Table 9. Life expectancy at birth and at 65 years of age, according to color and sex: United States, selected years 1900-1977

(Data are based on the national vital registration system)

Specified age and year	*Total*			*White*			*All other*		
	Both sexes	*Male*	*Female*	*Both sexes*	*Male*	*Female*	*Both sexes*	*Male*	*Female*
At birth	*Remaining life expectancy in years*								
1900[1]	47.3	46.3	48.3	47.6	46.6	48.7	33.0	32.5	33.5
1950	68.2	65.6	71.1	69.1	66.5	72.2	60.8	59.1	62.9
1960	69.7	66.6	73.1	70.6	67.4	74.1	63.6	61.1	66.3
1970[2]	70.9	67.1	74.8	71.7	68.0	75.6	65.3	61.3	69.4
1975[2]	72.5	68.7	76.5	73.2	69.4	77.2	67.9	63.6	72.3
1976[2]	72.8	69.0	76.7	73.5	69.7	77.3	68.3	64.1	72.6
1977[2]	73.2	69.3	77.1	73.8	70.0	77.7	68.8	64.6	73.1
At 65 years									
1900-1902[1]	11.9	11.5	12.2	—	11.5	12.2	—	10.4	11.4
1950	13.9	12.8	15.0	—	12.8	15.1	—	12.5	14.5
1960	14.3	12.8	15.8	14.4	12.9	15.9	13.9	12.7	15.2
1970[2]	15.2	13.1	17.0	15.2	13.1	17.1	14.9	13.3	16.4
1975[2]	16.0	13.7	18.0	16.0	13.7	18.1	15.7	13.7	17.5
1976[2]	16.0	13.7	18.0	16.1	13.7	18.1	15.8	13.8	17.6
1977[2]	16.3	13.9	18.3	16.3	13.9	18.4	16.0	14.0	17.8

[1] Death registration area only. The death registration area increased from 10 States and the District of Columbia in 1900 to the coterminous United States in 1933.

[2] Excludes deaths of nonresidents of the United States.

SOURCES: National Center for Health Statistics: *Vital Statistics Rates in the United States 1940-1960,* by R.D. Grove and A.M. Hetzel. DHEW Pub. No. (PHS) 1677. Public Health Service. Washington. U.S. Government Printing Office, 1968; *Vital Statistics of the United States, 1970,* Vol. II, Part A. DHEW Pub. No. (HRA) 75-1101. Health Resources Administration. Washington. U.S. Government Printing Office, 1974; Final mortality statistics, 1975-1977. *Monthly Vital Statistics Report.* Vols. 25, 26, and 28, Nos. 11, 12, and 1. DHEW Pub. Nos. (HRA) 77-1120, (PHS) 78-1120, and (PHS) 79-1120. Health Resources Administration and Public Health Service. Washington. U.S. Government Printing Office, Feb. 11, 1977, Mar. 30, 1978, and May 11, 1979; Unpublished data from the Division of Vital Statistics.

Table 10. Infant, late fetal, and perinatal mortality rates, according to race: United States, selected years 1950-77

(Data are based on the national vital registration system)

Race and year	Infant mortality rate[1]				Late fetal mortality rate[2]	Perinatal mortality rate[3]
	Total	Neonatal		Post-neonatal		
		Under 28 days	Under 7 days			
Total	*Number of deaths per 1,000 live births*					
1950	29.2	20.5	17.8	8.7	14.9	32.5
1955	26.4	19.1	17.0	7.3	12.9	29.7
1960	26.0	18.7	16.7	7.3	12.1	28.6
1965	24.7	17.7	15.9	7.0	11.9	27.6
1970[4]	20.0	15.1	13.6	4.9	9.5	23.0
1975[4]	16.1	11.6	10.0	4.5	7.8	17.7
1976[4]	15.2	10.9	9.3	4.3	7.5	16.7
1977[4]	14.1	9.9	8.4	4.2	7.1	15.4
White						
1950	26.8	19.4	17.1	7.4	13.3	30.1
1955	23.6	17.7	15.9	5.9	11.6	27.3
1960	22.9	17.2	15.6	5.7	10.8	26.2
1965	21.5	16.1	14.6	5.4	10.5	25.0
1970[4]	17.8	13.8	12.5	4.0	8.6	21.1
1975[4]	14.2	10.4	9.0	3.8	7.1	16.0
1976[4]	13.3	9.7	8.2	3.6	6.9	15.1
1977[4]	12.3	8.7	7.4	3.6	6.5	13.9
All other[5]						
1950	44.5	27.5	22.8	16.9	24.8	47.0
1955	42.8	27.2	22.9	15.6	20.5	43.0
1960	43.2	26.9	22.9	16.4	19.2	41.6
1965	40.3	25.4	22.1	14.9	18.8	40.5
1970[4]	30.9	21.4	19.1	9.5	13.9	32.7
1975[4]	24.2	16.8	14.4	7.5	10.8	25.0
1976[4]	23.5	16.3	13.9	7.2	10.1	23.8
1977[4]	21.7	14.7	12.3	7.0	9.5	21.7
Black:						
1950	43.9	27.8	23.0	16.1	—	—
1955	43.1	27.8	23.5	15.3	—	—
1960	44.3	27.8	23.7	16.5	—	—
1965	41.7	26.5	23.1	15.2	—	—
1970[4]	32.6	22.8	20.3	9.9	—	—
1975[4]	26.2	18.3	15.7	7.9	—	—
1976[4]	25.5	17.9	15.3	7.6	—	—
1977[4]	23.6	16.1	13.5	7.6	—	—

[1] Infant mortality rate is the number of deaths to infants under 1 year of age per 1,000 live births. Neonatal deaths are deaths within 28 days of birth; postneonatal deaths are deaths that occur from 28 days to 365 days after birth. Deaths within 7 days are considered early neonatal deaths.

[2] Late fetal deaths are fetal deaths of 28 weeks or more gestation. The rate is the number of late fetal deaths per 1,000 live births and late fetal deaths.

[3] Perinatal deaths are late fetal deaths plus infant deaths within 7 days of birth. The rate is the number of perinatal deaths per 1,000 live births and late fetal deaths.

[4] Excludes births and infant and late fetal deaths occurring to nonresidents of the United States.

[5] Includes black infants.

SOURCES: National Center for Health Statistics: *Vital Statistics of the United States*, Vol. II, 1950-77. Public Health Service. Washington. U.S. Government Printing Office; Data computed by the Division of Analysis from data compiled by the Division of Vital Statistics.

Table 11. Infant mortality rates, according to race, geographic division, and State: United States, average annual 1965-67, 1970-72, and 1975-77

(Data are based on the national vital registration system)

Geographic division and State	1965–67			1970–72[2]			1975–77[2]		
	Total[1]	White	Black	Total[1]	White	Black	Total[1]	White	Black
	Infant deaths per 1,000 live births								
United States	23.6	20.6	39.8	19.2	17.1	30.9	15.1	13.3	25.1
New England	21.2	20.4	36.7	16.8	16.2	30.0	12.8	12.2	23.6
Maine	22.6	22.6	*27.3	19.2	19.2	*24.4	11.2	11.3	*5.2
New Hampshire	21.1	21.0	*46.5	17.4	17.4	*25.0	11.6	11.7	*9.1
Vermont	21.9	21.9	*20.4	15.4	15.5	*-	11.9	12.0	*-
Massachusetts	21.1	20.4	36.9	16.2	15.5	29.7	12.5	12.1	19.9
Rhode Island	21.3	20.3	46.8	19.5	18.8	34.6	13.7	13.0	27.0
Connecticut	20.8	19.3	35.3	16.5	15.0	29.9	14.4	12.7	27.4
Middle Atlantic	22.6	19.7	39.5	18.6	16.3	30.8	15.3	13.2	25.1
New York	22.7	19.6	39.0	18.5	16.2	29.9	15.5	13.2	24.8
New Jersey	22.5	18.7	40.8	18.7	15.7	31.9	14.7	12.4	24.9
Pennsylvania	22.6	20.4	39.4	18.8	16.9	32.1	15.3	13.7	26.1
East North Central	22.7	20.5	38.7	19.2	17.1	31.7	15.2	13.3	26.5
Ohio	21.4	19.8	35.5	18.4	16.8	30.5	14.9	13.6	24.0
Indiana	22.9	21.5	37.2	19.0	17.9	29.5	14.5	13.5	23.7
Illinois	24.8	21.0	41.9	21.0	17.7	33.7	17.0	13.7	29.8
Michigan	22.7	20.5	37.7	19.5	17.2	31.2	15.2	13.2	25.3
Wisconsin	20.6	20.1	32.5	15.7	15.1	27.2	12.5	12.0	21.1
West North Central	21.3	19.9	40.1	18.1	17.2	30.7	14.0	13.1	25.5
Minnesota	19.9	19.6	38.4	17.4	17.2	25.4	12.8	12.5	23.9
Iowa	19.7	19.5	29.3	17.9	17.7	30.9	13.4	13.1	28.1
Missouri	23.9	20.5	42.8	19.2	17.1	31.0	15.3	13.4	25.9
North Dakota	21.0	20.3	*27.6	14.8	14.5	*29.9	14.1	13.4	*19.7
South Dakota	23.3	20.9	*26.7	19.0	16.9	*46.9	16.5	14.5	*28.9
Nebraska	20.3	19.6	32.0	18.0	17.2	36.8	13.6	13.2	25.2
Kansas	20.4	19.4	35.2	18.1	17.4	28.6	13.8	13.1	24.1
South Atlantic	26.9	21.2	40.6	21.0	17.3	31.0	16.9	13.6	25.2
Delaware	22.5	17.9	41.4	18.1	14.2	32.8	13.6	11.7	20.7
Maryland	23.4	20.0	35.9	17.9	15.0	27.9	16.2	13.5	23.7
District of Columbia	31.3	22.8	33.7	28.3	21.4	29.5	27.2	15.4	29.6
Virginia	25.4	21.3	38.7	20.6	17.5	32.1	16.5	13.8	25.9
West Virginia	26.1	25.4	40.2	21.1	20.7	32.0	16.6	16.2	25.9
North Carolina	28.8	21.4	45.4	23.1	18.8	34.1	17.3	13.9	25.4
South Carolina	29.7	21.6	41.6	22.4	17.2	31.4	18.8	14.2	26.2
Georgia	27.8	20.6	41.2	20.9	16.8	29.8	16.5	13.1	23.0
Florida	26.4	20.8	41.5	20.3	16.9	30.6	16.1	12.8	25.7
East South Central	29.1	22.8	44.7	22.3	18.3	33.5	17.3	14.1	26.1
Kentucky	24.8	23.2	41.5	18.8	18.0	26.7	14.9	14.3	21.4
Tennessee	26.2	22.4	39.6	20.9	18.3	30.7	15.9	13.7	24.1
Alabama	29.0	22.3	41.2	23.4	18.0	34.4	18.7	14.3	26.9
Mississippi	38.4	23.5	51.7	27.2	19.1	36.2	20.6	14.1	27.9

See footnotes at end of table.

Table 11. Infant mortality rates, according to race, geographic division, and State: United States, average annual 1965-67, 1970-72, and 1975-77—Continued

(Data are based on the national vital registration system)

Geographic division and State	1965–67			1970–72[2]			1975–77[2]		
	Total[1]	White	Black	Total[1]	White	Black	Total[1]	White	Black
	Infant deaths per 1,000 live births								
West South Central	25.4	21.6	39.4	20.9	18.8	29.9	16.2	14.1	25.1
Arkansas	25.2	20.6	36.4	19.9	17.8	26.4	16.3	13.8	24.1
Louisiana	28.6	20.2	41.2	22.9	18.8	29.7	18.0	13.2	25.6
Oklahoma	22.4	20.7	37.5	19.6	18.8	32.3	15.5	14.7	24.7
Texas	24.9	22.3	38.8	20.7	18.9	30.7	15.7	14.2	25.1
Mountain	23.3	21.9	34.2	18.2	17.5	26.3	13.7	13.2	21.1
Montana	23.8	22.6	*49.8	21.3	21.3	*23.0	15.2	15.2	*16.7
Idaho	21.6	21.5	*6.7	17.0	16.7	*-	12.5	12.5	*5.8
Wyoming	23.1	22.8	*25.4	23.2	22.8	*59.3	15.8	15.8	*20.2
Colorado	23.6	23.1	35.6	18.4	18.4	21.0	13.1	12.8	20.6
New Mexico	26.2	24.1	31.3	20.0	18.7	28.4	15.4	14.7	27.9
Arizona	25.3	21.9	36.8	17.7	16.2	26.3	14.5	13.4	19.7
Utah	17.8	17.4	*28.6	14.2	14.2	*15.7	11.6	11.3	*22.5
Nevada	23.0	22.1	31.3	21.1	19.6	34.6	15.1	14.6	21.3
Pacific	20.9	20.0	32.7	16.8	16.2	26.4	12.8	12.4	20.6
Washington	20.6	19.6	38.0	18.1	17.6	31.0	14.1	13.9	19.2
Oregon	20.6	20.3	34.2	17.0	16.9	23.8	13.2	13.1	21.0
California	20.8	20.0	32.2	16.5	15.7	26.2	12.6	12.0	20.7
Alaska	33.0	21.8	55.1	19.7	18.8	35.6	15.3	13.1	25.9
Hawaii	19.0	17.3	33.6	17.1	17.3	*15.6	11.7	11.9	*13.7

[1] Includes all other races not shown separately.

[2] Excludes births and infant deaths occurring to nonresidents of the United States.

SOURCE: National Center for Health Statistics: Data computed by the Division of Analysis from data compiled by the Division of Vital Statistics.

Table 12. Infant mortality rates and perinatal mortality ratios: Selected countries, 1972 and 1977

(Data are based on national vital registration systems)

Country	*Infant mortality rate* 1972	*Infant mortality rate* 1977[1]	*Average annual percent change 1972–77*	*Perinatal mortality ratio*[2] 1972[3]	*Perinatal mortality ratio*[2] 1977[4]	*Average annual percent change 1972–77*
	Infant deaths per 1,000 live births			*Perinatal deaths per 1,000 live births*		
Canada	17.1	14.3	-5.8	19.2	14.9	-8.1
United States	18.5	14.1	-5.3	21.9	17.3	-4.6
Austria	25.2	16.8	-7.8	26.1	17.5	-7.7
Denmark	12.2	8.7	-6.5	16.2	10.7	-8.0
England and Wales	17.2	13.8	-4.3	22.0	17.1	-4.9
France	16.0	13.8	-4.8	[5]18.8	18.3	-0.9
German Democratic Republic	17.6	13.1	-5.7	19.4	15.2	-4.8
German Federal Republic	22.7	15.5	-7.3	24.1	15.0	-9.0
Ireland	17.8	15.7	-2.5	23.5	21.8	-2.5
Italy	27.0	17.7	-8.1	29.6	20.8	-6.8
Netherlands	11.7	9.5	-4.1	16.7	13.0	-4.9
Sweden	10.8	8.0	-5.8	14.4	10.7	-7.2
Switzerland	13.3	9.8	-5.9	16.3	11.3	-7.1
Israel	21.3	17.8	-3.5	20.7	17.7	-3.1
Japan	11.7	8.9	-5.3	19.2	14.8	-6.3
Australia	16.7	13.8	-4.7	—	—	. . .
New Zealand	15.6	14.2	-1.9	19.4	14.4	-5.8

[1] Data for Canada and France refer to 1975; data for Australia and Norway refer to 1976; data for Italy and Israel are provisional.

[2] Fetal deaths of 28 weeks or more gestation plus infant deaths within 7 days per 1,000 live births. For all countries, fetal deaths of unknown gestation period are included in the 28 weeks or more gestation. This is not the usual way of calculating the perinatal ratio for the United States, but it was done for the purpose of comparison.

[3] Data for New Zealand refers to 1971.

[4] Data for Canada, France, and Ireland refer to 1975; data for Japan, New Zealand, and Sweden refer to 1976; data for Italy and Israel are provisional.

[5] Excludes infants who have died before registration of birth.

NOTE: Countries are grouped by continent.

SOURCES: World Health Organization: World Health Statistics, 1979. Vol. 1, Geneva. World Health Organization, 1979; United Nations: *Demographic Yearbook 1973, 1974, and 1976.* Pub. Nos. ST/STAT/SER.R/2, ST/ESA/STAT/R.3, and ST/ESA/STAT/SER.R/4. New York. United Nations, 1974, 1975, and 1977.

Table 13. Life expectancy at birth, according to sex: Selected countries, 1972 and 1977

(Data are based on reporting by countries)

Country	Male			Female		
	1972[1]	1977[2]	Average annual change in years	1972[1]	1977[2]	Average annual change in years
	Life expectancy in years			Life expectancy in years		
Canada	69.3	69.8	0.2	76.7	77.3	0.2
United States	67.4	69.3	0.4	75.1	77.1	0.4
Austria	66.9	68.5	0.3	74.1	75.5	0.3
Denmark	70.8	71.9	0.2	76.3	78.0	0.3
England and Wales	69.0	70.2	0.2	75.3	76.3	0.2
France	69.1	69.9	0.2	77.1	77.9	0.2
German Democratic Republic	68.9	68.9	-	74.2	74.5	0.1
German Federal Republic	67.6	69.2	0.3	74.2	76.0	0.4
Ireland	68.5	69.0	0.2	73.4	74.3	0.3
Italy	68.9	69.9	0.3	75.2	76.1	0.3
Netherlands	70.9	72.2	0.3	76.9	78.8	0.4
Sweden	72.1	72.8	0.1	77.7	79.2	0.3
Switzerland	70.7	72.1	0.3	77.0	79.0	0.4
Israel[3]	70.7	71.4	0.1	73.2	74.8	0.3
Japan	70.8	72.9	0.4	76.3	78.2	0.4
Australia	67.4	70.0	0.4	74.2	77.0	0.4
New Zealand	68.6	68.9	0.1	74.6	75.4	0.2

[1] Data for the German Democratic Republic refer to the average for the period 1969-70; data for Australia refer to 1970; data for New Zealand refer to the average for the period 1970-72.

[2] Data for Canada, Ireland, Italy, and New Zealand refer to 1975; data for the German Democratic Republic and France refer to 1976.

[3] Jewish population only for 1972.

NOTE: Countries are grouped by continent.

SOURCES: World Health Organization: World Health Statistics, 1972 and 1977. Vol. 1. Geneva. World Health Organization, 1975 and 1979; United Nations: *Demographic Yearbook, 1974 and 1977.* Pub. No. ST/ESA/STAT/R/3 and ST/ESA/STAT/SER.R/6. New York, United Nations, 1975 and 1978; National Center for Health Statistics: *Vital Statistics of the United States, 1972,* Vol. II, Sec. 5. DHEW Pub. No. (HRA) 75-1147. Health Resources Administration. Washington. U.S. Government Printing Office, 1974; Final mortality statistics, 1977. *Monthly Vital Statistics Report,* Vol. 28, No. 1, Supplement. DHEW Pub. No. (PHS) 79-1120. Public Health Service. Washington. U.S. Government Printing Office, May 11, 1979.

Table 14. Age-adjusted death rates for selected causes of death: United States, selected years 1950-77

(Data are based on the national vital registration system)

Cause of death	*Year*							
	1950	*1955*	*1960*	*1965*	*1970*	*1975*	*1976*	*1977*
	Deaths per 100,000 resident population							
All causes	841.5	764.5	760.9	739.0	714.3	638.3	627.5	612.3
Diseases of the heart	307.6	287.5	286.2	273.9	253.6	220.5	216.7	210.4
Cerebrovascular disease	88.8	83.0	79.7	72.7	66.3	54.5	51.4	48.2
Malignant neoplasms	125.4	125.8	125.8	127.0	129.9	130.9	132.3	133.0
Respiratory system	12.8	16.0	19.2	23.0	28.4	32.5	33.5	34.3
Digestive system	47.7	43.5	41.1	38.3	35.2	33.6	33.6	33.4
Breast[1]	22.2	22.7	22.3	22.8	23.1	22.8	23.1	23.5
Influenza and pneumonia	26.2	21.0	28.0	23.5	22.1	16.6	17.4	14.2
Bronchitis, emphysema, and asthma	—	—	—	—	11.6	8.6	7.9	7.2
Tuberculosis	21.7	8.4	5.4	3.6	2.2	1.2	1.1	1.0
Cirrhosis of liver	8.5	9.4	10.5	12.1	14.7	13.8	13.6	13.1
Diabetes mellitus	14.3	13.0	13.6	13.4	14.1	11.6	11.1	10.4
All accidents	57.5	54.4	49.9	53.3	53.7	44.8	43.2	43.8
Motor vehicle accidents	23.3	24.6	22.5	26.5	27.4	21.3	21.5	22.4
Suicide	11.0	9.9	10.6	11.4	11.8	12.6	12.3	12.9
Homicide	5.4	4.8	5.2	6.2	9.1	10.5	9.5	9.6

[1] Female only.

NOTE: Age-adjusted rates are computed by the direct method to the total population of the United States as enumerated in 1940, using 11 age groups.

SOURCES: National Center for Health Statistics: *Vital Statistics Rates in the United States, 1940-1960*, by R.D. Grove and A.M. Hetzel. DHEW Pub. No. (PHS) 1677. Public Health Service. Washington. U.S. Government Printing Office, 1968; Unpublished data from the Division of Vital Statistics.

Table 15. Death rates for diseases of the heart, according to race, sex, and age: United States, selected years 1950-77

(Data are based on the national vital registration system)

Race, sex, and age	Year							
	1950	1955	1960	1965	1970[1]	1975[1]	1976[1]	1977[1]
Total[2]	Number of deaths per 100,000 resident population							
All ages, age adjusted[3]	307.6	287.5	286.2	273.9	253.6	220.5	216.7	210.4
All ages, crude	356.8	356.5	369.0	368.0	362.0	336.2	337.2	332.3
Under 25 years	5.0	3.2	2.4	2.1	2.2	2.4	2.5	2.5
Under 1 year	4.1	7.4	6.6	9.8	13.1	20.3	23.1	23.1
1-24 years	5.0	3.0	2.1	1.7	1.8	1.8	1.8	1.8
25-29 years	14.8	11.7	9.9	8.6	7.0	5.6	5.6	5.7
30-34 years	27.5	22.4	20.9	19.5	16.6	12.4	12.1	11.8
35-39 years	57.3	49.1	47.7	46.0	40.8	32.6	30.1	30.0
40-44 years	122.5	107.7	103.5	98.8	90.7	76.0	72.8	70.5
45-49 years	228.7	200.8	197.6	188.4	174.4	147.3	145.7	137.8
50-54 years	397.5	362.0	355.8	340.4	308.3	261.9	252.5	248.6
55-59 years	642.2	584.1	571.6	535.7	514.3	437.0	423.2	405.3
60-64 years	1,007.9	915.2	934.2	905.6	811.9	710.3	701.7	678.7
65 years and over	2,844.5	2,772.7	2,823.0	2,778.7	2,683.3	2,403.9	2,393.5	2,334.0
65-69 years	1,494.6	1,427.9	1,412.6	1,348.1	1,263.8	1,049.5	1,021.6	992.3
70-74 years	2,348.1	2,168.5	2,173.5	1,999.9	1,936.4	1,708.2	1,658.6	1,605.8
75-79 years	3,683.4	3,462.1	3,358.8	3,242.5	3,052.2	2,716.1	2,707.6	2,654.7
80-84 years	5,476.1	5,421.5	5,501.5	5,103.6	4,744.1	4,133.8	4,090.6	3,998.6
85 years and over	9,151.0	8,917.2	9,317.8	9,538.4	7,891.3	7,282.0	7,384.3	7,095.8
White male								
All ages, age adjusted[3]	381.1	367.4	375.4	369.2	347.6	308.0	303.0	294.0
All ages, crude	434.2	438.5	454.6	450.8	438.3	401.1	399.4	392.4
Under 25 years	4.2	2.8	2.1	1.8	2.2	2.3	2.5	2.5
Under 1 year	4.6	6.7	6.9	8.9	12.0	19.3	22.4	24.0
1-24 years	4.2	2.6	1.9	1.5	1.8	1.8	1.8	1.7
25-29 years	14.4	12.3	9.5	8.2	6.8	6.1	6.0	6.2
30-34 years	29.0	26.6	24.9	22.6	18.8	14.4	14.9	14.7
35-39 years	68.4	66.7	66.0	62.2	54.8	43.4	41.3	41.1
40-44 years	160.4	152.4	151.7	144.8	131.3	111.6	109.2	102.6
45-49 years	313.3	291.6	300.4	287.1	266.0	228.5	223.2	210.3
50-54 years	544.6	523.9	540.4	520.3	474.2	405.9	390.1	382.2
55-59 years	878.6	836.8	842.0	812.8	784.3	668.9	642.7	614.1
60-64 years	1,324.3	1,262.6	1,311.6	1,314.8	1,209.9	1,067.4	1,049.0	1,004.0
65 years and over	3,302.2	3,251.2	3,363.2	3,401.3	3,316.2	2,986.0	2,963.2	2,894.8
65-69 years	1,939.7	1,889.6	1,928.7	1,903.1	1,828.8	1,567.9	1,537.2	1,487.0
70-74 years	2,852.9	2,724.2	2,788.8	2,679.5	2,641.4	2,367.3	2,317.7	2,260.5
75-79 years	4,248.7	4,090.3	4,099.6	4,082.8	3,939.0	3,600.1	3,603.3	3,542.3
80-84 years	6,186.6	6,258.3	6,340.5	6,137.4	5,828.7	5,283.2	5,219.4	5,142.5
85 years and over	9,959.6	9,316.0	10,135.8	10,657.3	8,818.0	8,550.3	8,692.9	8,472.2

See footnotes at end of table.

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Table 15. Death rates for diseases of the heart, according to race, sex, and age: United States, selected years 1950-77—Continued

(Data are based on the national vital registration system)

Race, sex, and age	*Year*							
	1950	*1955*	*1960*	*1965*	*1970*[1]	*1975*[1]	*1976*[1]	*1977*[1]
White female	*Number of deaths per 100,000 resident population*							
All ages, age adjusted[3]	223.6	204.0	197.1	183.9	167.8	144.2	141.7	137.2
All ages, crude	290.5	293.0	306.5	310.7	313.8	301.3	305.5	301.8
Under 25 years	4.2	2.4	1.7	1.5	1.4	1.7	1.6	1.7
Under 1 year	2.9	5.6	4.3	7.4	7.0	16.0	15.5	16.2
1-24 years	4.3	2.3	1.5	1.3	1.2	1.2	1.2	1.2
25-29 years	10.4	7.3	6.2	5.0	3.6	2.9	2.8	2.8
30-34 years	17.0	11.6	10.0	9.2	7.7	5.7	5.1	5.4
35-39 years	29.8	20.8	18.5	17.9	15.3	12.1	11.4	10.6
40-44 years	56.3	42.3	39.4	34.5	31.7	27.8	25.3	25.4
45-49 years	103.8	78.7	72.7	70.9	63.3	51.8	53.1	49.3
50-54 years	184.2	149.8	137.9	134.0	121.7	103.4	97.1	96.8
55-59 years	331.4	282.1	263.4	239.1	227.7	194.0	189.9	179.8
60-64 years	613.9	522.9	518.9	468.1	419.4	360.0	357.6	349.0
65 years and over	2,503.1	2,430.0	2,432.8	2,367.9	2,283.9	2,053.1	2,056.1	1,999.9
65-69 years	1,055.9	975.3	914.7	852.3	763.5	619.3	597.7	587.5
70-74 years	1,891.2	1,682.6	1,635.6	1,453.1	1,384.7	1,165.4	1,121.1	1,073.7
75-79 years	3,237.2	3,015.1	2,848.9	2,672.8	2,473.6	2,152.0	2,120.3	2,053.7
80-84 years	5,166.9	5,041.9	5,062.0	4,591.4	4,221.5	3,644.7	3,616.3	3,511.9
85 years and over	9,085.7	9,155.9	9,280.8	9,333.2	7,839.9	7,105.3	7,244.5	6,921.5
All other male[4]								
All ages, age adjusted[3]	407.5	369.2	368.3	366.2	350.8	307.0	302.8	297.8
All ages, crude	342.0	319.4	320.5	318.4	310.2	277.1	276.5	273.3
Under 25 years	9.7	6.8	5.3	4.9	5.2	4.9	5.5	5.1
Under 1 year	5.9	12.6	13.1	20.4	32.2	35.4	44.6	39.3
1-24 years	9.9	6.5	4.9	4.1	4.1	3.8	4.0	3.7
25-29 years	31.2	28.8	26.2	27.4	26.5	19.1	18.0	18.9
30-34 years	71.9	51.1	53.7	55.1	49.9	41.7	37.6	35.2
35-39 years	129.0	106.7	112.5	118.7	112.3	96.3	88.5	83.8
40-44 years	261.8	232.3	211.3	233.6	230.2	178.2	163.6	171.4
45-49 years	428.9	414.1	365.6	374.5	376.1	301.6	298.3	290.9
50-54 years	813.9	676.2	631.0	627.2	585.0	507.9	510.8	494.6
55-59 years	1,196.4	999.4	912.1	876.2	891.0	758.8	767.5	752.9
60-64 years	1,663.9	1,522.6	1,540.7	1,499.1	1,267.5	1,126.5	1,168.7	1,177.6
65 years and over	2,637.9	2,562.6	2,752.1	2,715.7	2,680.1	2,431.5	2,382.0	2,331.4
65-69 years	1,856.9	1,811.7	1,983.3	1,864.3	1,816.9	1,446.6	1,416.7	1,350.3
70-74 years	2,518.1	2,467.6	2,562.5	2,429.8	2,540.9	2,437.6	2,341.6	2,262.9
75-79 years	3,578.1	3,066.3	3,098.3	3,277.0	3,359.3	3,152.2	3,171.5	3,261.0
80-84 years	3,845.9	4,064.3	4,489.1	3,973.0	3,948.9	3,589.5	3,478.9	3,466.7
85 years and over	6,152.6	5,720.8	6,128.6	6,929.4	4,983.6	4,917.2	4,826.5	4,661.1

See footnotes at end of table.

Table 15. Death rates for diseases of the heart, according to race, sex, and age: United States, selected years 1950-77—Continued

(Data are based on the national vital registration system)

Race, sex, and age	Year							
	1950	1955	1960	1965	1970[1]	1975[1]	1976[1]	1977[1]
	Number of deaths per 100,000 resident population							
Black male:								
All ages, age adjusted[3]	415.5	—	381.2	384.1	375.9	328.9	326.0	322.4
All ages, crude	348.4	—	330.6	331.7	330.3	296.1	296.9	294.7
Under 25 years	9.8	—	5.3	5.1	5.4	5.2	5.7	5.4
Under 1 year	—	—	13.9	21.3	33.5	37.2	46.6	43.8
1-24 years	—	—	4.8	4.3	4.3	4.0	4.3	3.9
25-29 years	32.5	—	28.1	28.4	28.0	21.2	20.1	20.8
30-34 years	73.8	—	57.7	59.7	57.4	47.9	43.6	40.3
35-39 years	133.7	—	120.0	127.7	124.5	104.2	97.6	93.2
40-44 years	271.4	—	222.1	250.1	253.4	194.3	180.6	188.0
45-49 years	442.3	—	386.0	397.3	412.8	329.7	327.8	322.3
50-54 years	841.2	—	667.0	661.6	626.1	547.8	553.8	536.8
55-59 years	1,225.8	—	973.2	931.4	954.3	804.5	826.0	805.3
60-64 years	1,717.3	—	1,593.9	1,613.1	1,354.6	1,189.7	1,238.0	1,247.6
65 years and over	2,680.8	—	2,798.4	2,790.4	2,836.7	2,580.9	2,527.4	2,491.1
65-69 years	1,894.9	—	2,030.4	1,937.9	1,934.9	1,509.7	1,464.7	1,405.0
70-74 years	2,570.3	—	2,661.2	2,547.8	2,694.5	2,636.9	2,539.7	2,458.3
75-79 years	4,107.9	—	3,146.3	3,422.8	3,504.9	3,482.8	3,565.5	3,734.5
80-84 years		—	4,409.5	4,078.6	4,305.1	3,826.7	3,721.8	3,803.8
85 years and over		—	6,037.9	7,113.3	5,367.6	5,296.2	5,182.1	5,031.7
All other female[5]								
All ages, age adjusted[3]	342.9	293.0	283.3	259.9	236.6	194.6	190.3	188.7
All ages, crude	283.0	256.8	255.5	248.6	241.0	214.7	215.9	216.4
Under 25 years	11.4	7.5	5.3	4.6	4.7	3.9	4.1	4.0
Under 1 year	6.4	16.3	11.7	17.4	31.4	31.3	42.6	35.0
1-24 years	11.7	6.9	4.9	3.9	3.5	2.9	2.7	2.9
25-29 years	37.3	26.7	23.1	19.8	14.2	7.6	9.7	9.6
30-34 years	66.1	51.1	43.8	36.7	31.6	17.5	17.6	14.4
35-39 years	129.1	91.2	83.2	73.5	59.6	45.2	32.7	40.4
40-44 years	245.5	177.2	158.2	147.8	118.8	80.0	76.1	76.2
45-49 years	397.6	319.1	257.9	227.0	203.2	146.3	145.5	137.7
50-54 years	667.9	542.7	455.1	390.1	342.0	247.5	247.6	249.6
55-59 years	998.8	789.2	712.6	592.7	535.5	436.3	410.1	401.7
60-64 years	1,421.7	1,143.2	1,170.6	1,100.9	828.7	686.7	662.9	658.2
65 years and over	2,158.2	2,075.8	2,197.2	2,090.8	2,094.4	1,664.5	1,866.4	1,851.0
65-69 years	1,366.7	1,394.6	1,393.3	1,251.3	1,226.8	892.9	833.7	805.9
70-74 years	2,160.0	1,879.6	2,006.4	1,765.9	1,836.4	1,867.0	1,782.3	1,724.2
75-79 years	3,059.7	2,712.3	2,507.5	2,503.7	2,492.6	2,382.9	2,597.9	2,705.5
80-84 years	2,955.0	3,045.1	3,730.2	3,570.1	3,353.5	2,638.9	2,698.5	2,700.0
85 years and over	5,350.0	4,811.8	5,564.1	5,912.2	4,784.7	4,181.8	4,160.3	4,050.0

See footnotes at end of table.

Table 15. Death rates for diseases of the heart, according to race, sex, and age: United States, selected years 1950-77—Continued

(Data are based on the national vital registration system)

Race, sex, and age	Year							
	1950	1955	1960	1965	1970[1]	1975[1]	1976[1]	1977[1]
Black female:	*Number of deaths per 100,000 resident population*							
All ages, age adjusted[3]	349.5	—	292.6	271.1	251.7	209.4	205.1	204.2
All ages, crude	289.9	—	268.5	263.8	261.0	235.7	237.4	239.0
Under 25 years	11.4	—	5.4	4.8	4.8	4,2	4.2	4.3
Under 1 year	—	—	12.0	17.9	31.3	34.8	44.7	37.7
1-24 years	—	—	5.0	4.1	3.7	3.1	2.9	3.1
25-29 years	38.3	—	24.4	20.3	16.0	8.9	10.7	11.0
30-34 years	67.4	—	47.0	40.3	34.5	20.1	20.9	16.9
35-39 years	131.6	—	88.5	79.3	66.7	49.5	36.0	45.8
40-44 years	249.5	—	166.8	156.6	133.0	90.8	84.8	84.8
45-49 years	403.0	—	269.1	241.3	223.2	164.9	166.1	156.9
50-54 years	682.0	—	471.8	409.4	367.8	273.1	275.4	279.8
55-59 years	1,022.7	—	754.8	619.9	567.6	471.2	443.1	435.6
60-64 years	1,457.0	—	1,211.1	1,165.4	878.2	726.8	702.3	697.9
65 years and over	2,172.9	—	2,234.7	2,151.9	2,199.4	1,970.1	1,969.3	1,957.3
65-69 years	1,378.8	—	1,430.6	1,307.0	1,291.6	924.3	859.2	838.2
70-74 years	2,188.3	—	2,055.2	1,816.2	1,947.6	2,029.6	1,935.2	1,859.8
75-79 years	3,499.3	—	2,545.0	2,585.8	2,625.8	2,632.5	2,869.9	3,060.6
80-84 years		—	3,743.1	3,632.9	3,536.8	2,798.3	2,884.4	2,874.2
85 years and over		—	5,650.0	5,030.4	5,003.8	4,398.0	4,344.0	4,247.1

[1] Excludes deaths of nonresidents of the United States.

[2] Includes all races and both sexes.

[3] Age adjusted by the direct method to the total population of the United States as enumerated in 1940, using 11 age groups.

[4] Includes black males.

[5] Includes black females.

NOTE: The *International Classification of Diseases, Adapted for Use in the United States* revisions and code numbers for diseases of the heart are *Sixth Revision*, Nos. 400-402, 410-443, for 1950 and 1955; *Seventh Revision*, Nos. 400-402, 410-443, for 1960 and 1965; and *Eighth Revision*, Nos. 390-398, 402, 404, 410-414, 420-429, for 1970-77.

SOURCES: National Center for Health Statistics: *Vital Statistics of the United States*, Vol. II, 1950-77. Public Health Service. Washington. U.S. Government Printing Office; Data computed by the Division of Analysis from data compiled by the Division of Vital Statistics; U.S. Bureau of the Census: Population estimates and projections. *Current Population Reports*. Series P-25, Nos. 310, 519, 643, and 721. Washington. U.S. Government Printing Office, June 1965, Apr. 1974, Jan. 1977, and Apr. 1978; *1950 Nonwhite Population by Race*. Special report P-E No. 3B. Washington. U.S. Government Printing Office, 1951; General population characteristics, United States summary, 1960 and 1970, *U.S. Census of Population*. Final reports PC(1)-1B and PC(1)-B1. Washington. U.S. Government Printing Office, 1961 and 1972.

Table 16. Death rates for ischemic heart disease, according to race, sex, and age: United States, selected years 1968-77

(Data are based on the national vital registration system)

Race, sex, and age	Year					
	1968	1969	1970[1]	1975[1]	1976[1]	1977[1]
Total[2]	*Number of deaths per 100,000 resident population*					
All ages, age adjusted[3]	241.6	234.7	228.1	196.1	191.6	185.0
All ages, crude	338.4	332.6	328.1	301.7	301.0	295.1
Under 25 years	0.3	0.3	0.3	0.2	0.2	0.2
25-29 years	2.8	2.9	3.1	2.0	2.1	2.0
30-34 years	10.4	10.1	10.0	7.4	7.4	6.9
35-39 years	32.4	32.1	30.4	23.8	22.0	21.8
40-44 years	79.3	76.6	73.7	62.3	59.8	56.8
45-49 years	158.3	153.2	148.6	126.3	123.2	117.0
50-54 years	283.8	275.7	269.6	228.6	218.6	214.0
55-59 years	479.2	463.2	457.9	385.5	370.4	354.4
60-64 years	781.5	744.4	733.1	633.8	622.1	598.5
65 years and over	2,573.1	2,527.1	2,470.4	2,186.7	2,166.2	2,101.2
65-69 years	1,213.6	1,178.0	1,151.9	944.5	912.8	882.1
70-74 years	1,862.8	1,813.2	1,785.3	1,547.5	1,495.1	1,438.8
75-79 years	2,932.7	2,835.6	2,824.2	2,481.6	2,458.1	2,394.8
80-84 years	4,581.0	4,519.8	4,383.5	3,777.4	3,716.2	3,617.9
85 years and over	8,483.0	8,284.5	7,249.4	6,640.0	6,715.0	6,420.1
White male						
All ages, age adjusted[3]	336.6	329.1	320.3	280.6	274.2	264.7
All ages, crude	419.3	411.9	404.9	366.3	362.5	354.2
Under 25 years	0.3	0.3	0.3	0.3	0.2	0.2
25-29 years	3.4	3.3	3.8	2.8	2.8	2.4
30-34 years	13.7	13.3	13.3	10.6	10.6	10.1
35-39 years	48.7	48.5	46.0	35.8	34.0	33.1
40-44 years	123.4	120.0	115.6	99.1	96.6	89.2
45-49 years	255.0	248.7	240.2	205.4	199.3	188.3
50-54 years	454.1	442.5	433.0	368.8	350.7	343.3
55-59 years	746.5	731.9	722.2	608.5	582.2	554.0
60-64 years	1,187.1	1,144.2	1,120.7	977.6	952.0	907.6
65 years and over	3,204.0	3,153.9	3,090.3	2,747.3	2,712.0	2,633.4
65-69 years	1,760.1	1,723.8	1,698.5	1,441.3	1,402.6	1,349.9
70-74 years	2,582.9	2,524.2	2,468.7	2,179.7	2,121.6	2,056.7
75-79 years	3,792.5	3,686.6	3,686.6	3,323.3	3,307.0	3,232.2
80-84 years	5,597.4	5,560.1	5,436.4	4,859.0	4,778.4	4,686.6
85 years and over	9,598.7	9,443.1	8,164.2	7,841.9	7,954.4	7,683.4

See footnotes at end of table.

Table 18. Death rates for ischemic heart disease, according to race, sex, and age: United States, selected years 1968-77—Continued

(Data are based on the national vital registration system)

Race, sex, and age	Year					
	1968	*1969*	*1970*[1]	*1975*[1]	*1976*[1]	*1977*[1]
White female	*Number of deaths per 100,000 resident population*					
All ages, age adjusted[3]	157.6	152.4	148.5	126.3	123.6	119.0
All ages, crude	286.6	283.7	282.5	269.2	272.0	267.5
Under 25 years	0.2	0.2	0.1	0.1	0.1	0.1
25-29 years	1.1	1.0	1.2	0.6	0.8	0.7
30-34 years	3.4	3.0	3.5	2.3	2.1	2.1
35-39 years	8.7	9.2	8.4	7.1	6.3	5.8
40-44 years	23.3	22.4	21.1	18.8	17.5	17.0
45-49 years	48.6	46.0	45.8	38.9	39.5	36.3
50-54 years	99.3	95.8	96.1	81.7	76.5	75.5
55-59 years	200.1	188.5	189.6	161.6	155.8	147.6
60-64 years	381.3	358.2	364.1	308.9	306.9	296.7
65 years and over	2,174.5	2,139.7	2,093.4	1,863.6	1,858.0	1,799.2
65-69 years	731.0	700.3	685.3	546.5	522.5	510.8
70-74 years	1,315.4	1,280.1	1,269.0	1,046.5	1,004.2	954.9
75-79 years	2,372.5	2,289.1	2,276.3	1,963.3	1,922.0	1,850.8
80-84 years	4,095.3	4,025.6	3,889.7	3,331.1	3,284.9	3,179.7
85 years and over	8,311.6	8,118.8	7,192.3	6,484.7	6,596.1	6,281.9
All other male[4]						
All ages, age adjusted[3]	316.6	306.7	294.4	254.0	249.4	245.3
All ages, crude	278.8	269.5	261.1	229.9	228.3	225.7
Under 25 years	0.9	0.7	0.7	0.5	0.3	0.4
25-29 years	10.6	11.5	10.9	6.5	6.1	7.6
30-34 years	31.9	36.6	28.5	20.9	20.9	18.8
35-39 years	87.6	81.9	75.0	61.1	59.7	57.7
40-44 years	182.9	180.4	174.0	135.2	122.8	128.1
45-49 years	328.9	318.9	304.5	245.4	234.8	232.2
50-54 years	521.9	521.7	483.5	421.5	422.9	404.8
55-59 years	820.6	766.7	750.1	633.8	637.4	626.5
60-64 years	1,222.9	1,128.2	1,084.7	950.4	985.6	989.5
65 years and over	2,469.4	2,421.0	2,349.4	2,086.8	2,034.8	1,990.7
65-69 years	1,655.5	1,630.6	1,568.2	1,223.3	1,200.8	1,145.7
70-74 years	2,318.5	2,213.8	2,234.3	2,096.3	1,985.5	1,930.2
75-79 years	2,979.0	3,010.0	2,966.7	2,712.3	2,723.6	2,795.7
80-84 years	3,535.8	3,661.8	3,471.9	3,117.4	2,984.4	2,939.8
85 years and over	5,958.5	5,259.1	4,418.8	4,245.3	4,176.5	4,030.6

See footnotes at end of table.

Table 16. Death rates for ischemic heart disease, according to race, sex, and age: United States, selected years 1968-77—Continued

(Data are based on the national vital registration system)

Race, sex, and age	*Year*					
	1968	*1969*	*1970*[1]	*1975*[1]	*1976*[1]	*1977*[1]
Black male:	*Number of deaths per 100,000 resident population*					
All ages, age adjusted[3]	332.9	323.6	314.5	271.2	267.5	264.5
All ages, crude	290.8	282.0	277.2	244.9	244.2	242.5
Under 25 years	0.8	0.7	0.7	0.6	0.4	0.4
25-29 years	11.8	12.9	11.7	7.4	7.0	8.7
30-34 years	35.4	39.9	32.7	23.9	23.6	21.5
35-39 years	94.0	89.1	83.3	65.3	65.5	63.2
40-44 years	196.5	192.6	191.3	147.8	135.5	140.4
45-49 years	348.8	341.2	333.0	267.6	257.7	255.9
50-54 years	548.8	552.6	516.0	453.7	456.5	438.5
55-59 years	864.7	813.9	803.3	669.2	684.8	667.4
60-64 years	1,302.5	1,198.2	1,157.8	1,000.8	1,041.3	1,044.5
65 years and over	2,560.5	2,518.4	2,479.5	2,207.8	2,150.3	2,119.1
65-69 years	1,737.4	1,711.4	1,664.3	1,275.4	1,235.8	1,188.0
70-74 years	2,397.3	2,301.6	2,364.8	2,253.5	2,142.9	2,088.4
75-79 years	3,039.8	3,106.4	3,085.7	2,986.2	3,047.9	3,189.4
80-84 years	3,777.2	3,913.[illegible]	3,778.5	3,318.7	3,193.6	3,205.1
85 years and over	6,302.9	5,602.7	4,743.7	4,558.5	4,464.3	4,348.3
All other female[5]						
All ages, age adjusted[3]	213.0	201.4	194.8	159.1	153.8	152.3
All ages, crude	213.4	204.2	200.4	177.7	176.9	177.0
Under 25 years	0.4	0.5	0.4	0.2	0.2	0.3
25-29 years	3.8	6.0	4.3	2.2	2.2	2.0
30-34 years	17.9	14.0	15.7	8.6	8.3	6.5
35-39 years	40.5	39.2	38.3	26.5	17.6	23.8
40-44 years	97.5	86.1	79.8	52.9	49.8	50.8
45-49 years	166.3	154.3	149.1	111.6	104.5	102.0
50-54 years	287.7	270.0	265.3	192.7	194.7	190.0
55-59 years	474.9	447.0	433.3	349.2	320.1	325.7
60-64 years	809.3	745.3	703.6	570.1	541.7	541.2
65 years and over	1,943.5	1,869.7	1,830.0	1,606.6	1,595.6	1,570.2
65-69 years	1,198.1	1,142.4	1,055.3	749.8	698.4	669.0
70-74 years	1,602.4	1,559.7	1,590.2	1,592.7	1,509.4	1,445.2
75-79 years	2,326.3	2,157.7	2,205.6	2,070.2	2,237.4	2,286.3
80-84 years	3,100.0	2,975.8	2,949.1	2,302.3	2,332.8	2,332.9
85 years and over	5,096.7	4,930.7	4,227.9	3,662.7	3,590.9	3,496.2

See footnotes at end of table.

Table 18. Death rates for ischemic heart disease, according to race, sex, and age: United States, selected years 1968-77—Continued

(Data are based on the national vital registration system)

Race, sex, and age	Year					
	1968	1969	1970[1]	1975[1]	1976[1]	1977[1]
Black female:	*Number of deaths per 100,000 resident population*					
All ages, age adjusted[3]	223.2	212.3	207.1	171.1	165.5	164.8
All ages, crude	227.4	218.8	217.0	195.2	194.5	195.6
Under 25 years	0.5	0.5	0.5	0.2	0.3	0.3
25-29 years	4.1	6.5	4.9	2.5	2.6	2.5
30-34 years	19.8	15.9	17.5	9.9	9.8	7.9
35-39 years	44.0	42.5	43.5	29.6	19.8	27.3
40-44 years	107.2	94.8	89.1	60.7	55.9	57.1
45-49 years	179.4	167.1	163.6	126.6	118.8	117.5
50-54 years	303.7	288.7	285.5	212.6	216.8	214.4
55-59 years	500.0	472.5	459.2	377.1	345.1	354.6
60-64 years	849.5	785.8	747.7	605.0	573.4	573.5
65 years and over	2,012.4	1,947.8	1,920.2	1,696.1	1,682.8	1,658.4
65-69 years	1,250.4	1,200.3	1,111.8	777.3	721.3	695.2
70-74 years	1,678.1	1,627.4	1,683.5	1,731.3	1,638.1	1,556.2
75-79 years	2,411.3	2,258.3	2,320.0	2,282.2	2,491.9	2,581.9
80-84 years	3,158.0	3,120.5	3,110.5	2,439.8	2,490.2	2,483.9
85 years and over	5,269.6	5,070.0	4,418.2	3,843.4	3,747.7	3,663.9

[1] Excludes deaths of nonresidents of the United States.

[2] Includes all races and both sexes.

[3] Age adjusted by the direct method to the total population of the United States as enumerated in 1940, using 11 age groups.

[4] Includes black males.

[5] Includes black females.

NOTE: The code numbers for ischemic heart disease are Nos. 410-413, based on the *Eighth Revision International Classification of Diseases, Adapted for Use in the United States.*

SOURCES: National Center for Health Statistics: *Vital Statistics of the United States*, Vol. II, 1968-77. Public Health Service. Washington. U.S. Government Printing Office; Data computed by the Division of Analysis from data compiled by the Division of Vital Statistics; U.S. Bureau of the Census: Population estimates and projections. *Current Population Reports*. Series P-25, Nos. 519, 643, and 721. Washington. U.S. Government Printing Office, Apr. 1974, Jan. 1977, and Apr. 1978.

Table 17. Death rates for malignant neoplasms, according to race, sex, and age: United States, selected years 1950-77

(Data are based on the national vital registration system)

Race, sex, and age	Year							
	1950	1955	1960	1965	1970[1]	1975[1]	1976[1]	1977[1]
Total[2]	*Number of deaths per 100,000 resident population*							
All ages, age adjusted[3]	125.4	125.8	125.8	127.0	129.9	130.9	132.3	133.0
All ages, crude	139.8	146.5	149.2	153.8	162.8	171.7	175.8	178.7
Under 25 years	8.5	8.6	8.1	7.5	7.0	5.7	5.7	5.6
Under 1 year	8.7	7.7	7.2	7.1	4.7	4.2	3.2	3.8
1-24 years	8.5	8.6	8.2	7.6	7.1	5.8	5.7	5.6
25-29 years	15.1	14.6	14.7	13.8	12.7	11.4	11.2	11.2
30-34 years	25.3	23.7	23.8	24.0	21.0	19.2	18.7	18.4
35-39 years	45.8	44.5	43.0	42.4	40.9	35.5	35.2	34.5
40-44 years	81.2	79.2	77.6	78.4	76.8	71.2	68.9	68.9
45-49 years	137.0	135.7	135.4	136.1	139.3	136.6	134.4	133.5
50-54 years	216.9	219.7	224.2	227.4	229.6	226.2	228.4	229.9
55-59 years	329.6	327.4	327.8	330.5	357.5	352.7	356.2	356.5
60-64 years	468.5	466.2	478.3	496.1	498.8	519.7	533.5	539.6
65 years and over	851.3	869.5	870.9	887.0	923.4	961.1	979.0	988.4
65-69 years	598.8	638.0	634.6	647.9	674.0	670.3	685.3	691.9
70-74 years	830.0	812.7	818.6	829.9	857.1	923.1	927.8	931.2
75-79 years	1,077.6	1,067.1	1,032.9	1,047.0	1,099.5	1,152.9	1,185.0	1,201.4
80-84 years	1,294.2	1,294.9	1,310.1	1,239.2	1,286.1	1,326.0	1,343.1	1,364.9
85 years and over	1,450.8	1,465.3	1,450.0	1,483.6	1,320.7	1,408.8	1,441.5	1,445.6
White male								
All ages, age adjusted[3]	130.9	137.4	141.6	147.8	154.3	157.2	159.1	160.0
All ages, crude	147.2	160.0	166.1	173.7	185.1	194.8	199.2	202.5
Under 25 years	9.7	10.4	9.7	8.8	8.5	6.8	6.8	6.9
Under 1 year	9.6	8.7	7.9	6.2	4.3	4.5	3.1	4.5
1-24 years	9.7	10.4	9.8	8.9	8.6	6.8	6.9	7.0
25-29 years	15.0	15.0	16.4	15.0	13.7	12.5	12.1	12.9
30-34 years	20.6	19.8	21.1	21.1	19.1	18.2	16.4	16.2
35-39 years	32.7	33.0	33.8	35.5	33.6	29.4	29.8	29.8
40-44 years	57.2	56.2	59.7	63.4	65.3	59.6	58.7	57.9
45-49 years	110.4	113.5	114.5	119.5	122.9	124.3	124.7	120.1
50-54 years	194.7	209.5	219.9	222.9	225.4	224.9	225.1	228.6
55-59 years	327.9	340.5	360.1	368.3	397.4	378.2	382.7	380.4
60-64 years	506.0	529.6	559.3	598.1	617.0	619.7	630.5	637.5
65 years and over	986.0	1,045.6	1,073.4	1,144.9	1,221.2	1,296.0	1,318.3	1,330.1
65-69 years	685.5	767.1	780.0	832.0	879.3	887.3	900.3	898.7
70-74 years	965.2	906.4	1,029.9	1,078.3	1,153.8	1,248.8	1,247.4	1,264.1
75-79 years	1,261.4	1,297.0	1,297.9	1,376.3	1,493.3	1,616.8	1,672.8	1,686.6
80-84 years	1,573.4	1,633.0	1,648.4	1,647.5	1,770.2	1,923.3	1,964.8	1,994.1
85 years and over	1,733.9	1,746.9	1,791.4	1,958.7	1,772.2	2,046.6	2,110.9	2,163.1

See footnotes at end of table.

Table 17. Death rates for malignant neoplasms, according to race, sex, and age: United States, selected years 1950-77—Continued

(Data are based on the national vital registration system)

Race, sex, and age	Year							
	1950	*1955*	*1960*	*1965*	*1970*[1]	*1975*[1]	*1976*[1]	*1977*[1]
White female	*Number of deaths per 100,000 resident population*							
All ages, age adjusted[3]	119.4	114.3	109.5	107.4	107.6	106.9	108.2	108.3
All ages, crude	139.9	141.0	139.8	141.9	149.4	157.7	162.0	164.5
Under 25 years	7.8	7.4	7.0	6.7	6.0	4.9	4.7	4.4
Under 1 year	7.8	7.2	6.8	6.2	5.4	4.2	3.6	3.3
1-24 years	7.8	7.4	7.0	6.7	6.0	4.9	4.8	4.4
25-29 years	14.8	13.8	12.7	12.4	11.6	10.2	10.3	9.5
30-34 years	27.3	25.7	24.2	25.1	21.8	19.5	20.3	19.7
35-39 years	53.9	51.7	47.9	44.3	44.5	37.7	38.6	35.5
40-44 years	97.4	93.3	86.7	85.0	78.8	75.0	71.0	71.0
45-49 years	153.1	144.8	143.8	140.4	142.6	134.3	131.3	131.9
50-54 years	221.1	213.8	211.6	216.5	214.8	208.1	209.5	208.4
55-59 years	314.5	297.8	281.7	279.0	301.9	302.9	306.3	306.0
60-64 years	419.4	394.5	382.6	380.8	380.0	406.6	420.7	427.1
65 years and over	768.4	747.6	718.4	702.0	714.3	729.2	744.9	752.1
65-69 years	534.2	526.7	500.3	488.3	495.6	486.1	506.7	518.8
70-74 years	733.1	679.5	641.6	623.6	626.4	655.4	661.2	654.6
75-79 years	956.1	912.7	847.8	820.5	836.2	842.2	856.6	863.4
80-84 years	1,153.1	1,114.8	1,107.2	1,005.8	1,011.9	1,019.6	1,023.7	1,050.2
85 years and over	1,348.1	1,357.6	1,304.9	1,257.5	1,126.6	1,165.9	1,192.8	1,181.8
All other male[4]								
All ages, age adjusted[3]	125.8	138.7	154.8	167.3	185.3	199.7	202.3	205.4
All ages, crude	106.1	119.1	134.1	144.3	161.0	175.3	179.2	183.2
Under 25 years	7.2	7.3	6.9	6.4	6.7	5.5	5.8	5.4
Under 1 year	10.4	6.9	6.5	6.1	4.7	3.8	4.7	4.0
1-24 years	7.0	7.3	6.9	6.4	6.8	5.6	5.8	5.5
25-29 years	14.8	12.0	14.7	13.1	11.4	11.6	10.6	10.3
30-34 years	21.5	21.8	21.7	19.5	23.6	18.5	17.6	19.3
35-39 years	39.7	38.3	47.3	48.8	44.1	45.6	37.1	42.8
40-44 years	74.4	84.9	99.3	103.6	108.1	100.5	99.7	103.3
45-49 years	144.6	170.3	169.9	184.6	213.9	208.8	204.4	211.8
50-54 years	282.3	277.6	308.8	327.2	373.7	382.1	385.0	388.3
55-59 years	421.1	447.6	433.7	485.9	553.3	612.7	618.8	628.6
60-64 years	571.6	643.2	710.6	754.8	750.3	863.0	909.7	890.5
65 years and over	691.6	810.4	982.4	1,073.8	1,221.1	1,351.5	1,377.7	1,414.0
65-69 years	579.2	722.0	864.1	901.4	988.8	1,035.1	1,017.5	1,025.5
70-74 years	720.7	818.7	1,021.2	1,119.3	1,266.3	1,503.2	1,568.8	1,572.8
75-79 years	896.9	891.6	1,038.0	1,217.7	1,504.5	1,700.7	1,813.9	1,951.1
80-84 years	751.4	957.1	1,195.5	1,252.4	1,593.8	1,654.7	1,671.1	1,706.5
85 years and over	900.0	1,045.8	1,211.7	1,458.8	1,268.4	1,479.7	1,473.5	1,609.7

See footnotes at end of table.

Table 17. Death rates for malignant neoplasms, according to race, sex, and age: United States, selected years 1950-77—Continued

(Data are based on the national vital registration system)

Race, sex, and age	Year							
	1950	*1955*	*1960*	*1965*	*1970*[1]	*1975*[1]	*1976*[1]	*1977*[1]
Black male:	*Number of deaths per 100,000 resident population*							
All ages, age adjusted[3]	126.1	—	158.5	174.1	198.0	214.4	217.7	221.9
All ages, crude	106.6	—	136.7	149.2	171.6	188.5	193.5	198.2
Under 25 years	7.1	—	6.7	6.4	6.8	5.7	6.0	5.5
Under 1 year	—	—	6.8	6.0	5.3	3.1	4.5	3.0
1-24 years	—	—	6.7	6.4	6.9	5.8	6.0	5.6
25-29 years	15.3	—	15.0	13.9	12.8	12.5	11.4	11.1
30-34 years	21.1	—	21.7	20.3	25.9	19.9	18.4	20.6
35-39 years	39.3	—	47.7	51.1	46.6	48.1	40.0	44.9
40-44 years	74.3	—	101.2	107.5	115.7	110.3	108.8	113.6
45-49 years	147.5	—	177.9	195.3	229.2	229.3	223.2	233.5
50-54 years	288.5	—	324.4	344.6	404.1	416.1	418.2	424.1
55-59 years	425.2	—	461.4	511.9	595.7	657.8	666.6	676.7
60-64 years	580.1	—	740.1	802.8	802.3	915.8	970.4	951.3
65 years and over	696.1	—	980.4	1,097.4	1,297.6	1,441.6	1,475.0	1,515.5
65-69 years	581.2	—	886.5	939.5	1,049.4	1,086.9	1,062.7	1,062.3
70-74 years	733.3	—	1,017.1	1,136.5	1,349.1	1,621.9	1,714.3	1,707.0
75-79 years	853.5	—	1,012.6	1,247.5	1,580.6	1,875.0	2,026.1	2,254.0
80-84 years		—	1,145.2	1,246.4	1,707.7	1,784.0	1,783.3	1,893.6
85 years and over		—	1,155.2	1,456.7	1,387.0	1,573.6	1,614.3	1,701.7
All other female[5]								
All ages, age adjusted[3]	131.0	124.7	125.0	120.9	117.6	118.9	119.3	122.4
All ages, crude	110.1	108.4	109.8	109.2	110.0	115.5	117.8	121.2
Under 25 years	6.4	5.5	5.9	5.3	4.9	4.6	4.2	4.7
Under 1 year	6.9	5.3	6.5	3.8	3.3	2.7	0.8	2.6
1-24 years	6.4	5.5	5.9	5.4	5.0	4.6	4.3	4.7
25-29 years	19.6	19.9	17.1	15.3	14.4	11.1	11.3	11.8
30-34 years	49.1	38.8	41.5	40.4	25.5	23.9	23.9	23.6
35-39 years	89.1	82.9	72.1	71.4	60.2	51.4	45.3	51.2
40-44 years	155.9	144.8	128.4	119.1	115.2	95.1	94.3	95.0
45-49 years	223.5	226.4	207.1	194.4	173.9	177.9	164.1	167.9
50-54 years	335.7	312.0	300.7	271.2	267.0	251.0	270.9	272.8
55-59 years	446.2	390.7	369.6	343.6	357.1	368.1	357.8	372.4
60-64 years	528.3	446.0	505.4	508.1	422.6	459.3	471.9	490.6
65 years and over	513.5	542.2	591.0	597.0	641.6	683.3	700.9	707.6
65-69 years	429.2	478.0	498.3	341.8	534.0	484.5	492.0	502.6
70-74 years	565.2	551.3	596.6	590.8	672.4	810.3	801.5	807.1
75-79 years	617.7	672.8	676.6	671.3	729.1	917.1	940.1	1,024.6
80-84 years	525.0	545.1	757.2	690.9	744.2	769.5	822.6	777.9
85 years and over	719.2	641.2	727.5	942.9	758.9	732.7	819.0	768.9

See footnotes at end of table.

Table 17. Death rates for malignant neoplasms, according to race, sex, and age: United States, selected years 1950-77—Continued

(Data are based on the national vital registration system)

Race, sex, and age	Year							
	1950	1955	1960	1965	1970[1]	1975[1]	1976[1]	1977[1]
Black female:	Number of deaths per 100,000 resident population							
All ages, age adjusted[3]	131.9	—	127.8	124.3	123.5	124.7	125.9	129.8
All ages, crude	111.8	—	113.8	113.6	117.3	123.3	126.8	131.0
Under 25 years	6.5	—	6.0	5.4	5.1	4.7	4.2	4.8
Under 1 year	—	—	6.7	3.0	3.3	2.7	0.5	2.2
1-24 years	—	—	5.9	5.5	5.2	4.8	4.3	4.9
25-29 years	19.7	—	18.4	16.6	15.4	11.2	12.3	13.6
30-34 years	50.6	—	43.1	43.9	27.0	25.4	25.8	25.6
35-39 years	89.2	—	75.9	73.9	64.6	54.8	48.4	54.6
40-44 years	156.6	—	132.4	124.6	124.7	101.4	100.3	102.6
45-49 years	227.3	—	210.7	201.8	183.2	191.3	177.3	181.8
50-54 years	339.5	—	308.4	278.4	280.3	270.6	290.6	297.0
55-59 years	449.9	—	384.8	355.0	370.7	385.5	377.7	393.5
60-64 years	530.1	—	518.5	527.4	444.7	472.7	491.1	510.0
65 years and over	513.0	—	591.4	601.2	668.4	704.4	730.3	737.2
65-69 years	428.4	—	505.0	515.5	558.3	489.0	497.8	512.0
70-74 years	569.5	—	596.5	593.5	702.3	860.1	855.5	853.8
75-79 years	605.3	—	673.4	670.1	762.5	989.8	1,028.6	1,147.1
80-84 years		—	745.1	672.6	764.7	789.0	871.3	807.3
85 years and over		—	728.9	934.8	791.5	733.0	844.0	784.9

[1] Excludes deaths of nonresidents of the United States.

[2] Includes all races and both sexes.

[3] Age adjusted by the direct method to the total population of the United States as enumerated in 1940, using 11 age groups.

[4] Includes black males.

[5] Includes black females.

NOTE: The *International Classification of Diseases, Adapted for Use in the United States* revisions and code numbers for malignant neoplasms are *Sixth Revision*, Nos. 140-205, for 1950 and 1955; *Seventh Revision*, Nos. 140-205, for 1960 and 1965; and *Eighth Revision*, Nos. 140-209, for 1970-77.

SOURCES: National Center for Health Statistics: *Vital Statistics of the United States*, Vol. II, 1950-77. Public Health Service. Washington. U.S. Government Printing Office; Data computed by the Division of Analysis from data compiled by the Division of Vital Statistics; U.S. Bureau of the Census: Population estimates and projections. *Current Population Reports*. Series P-25, Nos. 310, 519, 643, and 721. Washington. U.S. Government Printing Office, June 1965, Apr. 1974, Jan. 1977, and Apr. 1978; *1950 Nonwhite Population by Race*. Special report P-E No. 3B. Washington. U.S. Government Printing Office, 1951; General population characteristics, United States summary, 1960 and 1970, *U.S. Census of Population*. Final reports PC(1)-1B and PC(1)-B1, Washington. U.S. Government Printing Office, 1961 and 1972.

Table 18. Death rates for cancer of the respiratory system, according to race, sex, and age: United States, selected years 1950-77

(Data are based on the national vital registration system)

Race, sex, and age	Year							
	1950	1955	1960	1965	1970[1]	1975[1]	1976[1]	1977[1]
Total[2]	*Number of deaths per 100,000 resident population*							
All ages, age adjusted[3]	12.8	16.0	19.2	23.0	28.4	32.5	33.5	34.3
All ages, crude	14.1	18.2	22.2	26.9	34.2	40.7	42.5	44.0
Under 25 years	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25-34 years	0.9	1.0	1.1	1.0	1.0	0.9	0.9	1.0
35-44 years	5.1	5.9	7.3	9.3	11.6	11.0	10.7	10.6
45-54 years	22.9	27.4	32.0	38.4	46.2	52.3	53.4	55.1
55-64 years	55.2	68.5	81.5	93.5	116.2	131.9	135.6	137.3
65 years and over	69.0	90.2	111.0	136.1	170.1	202.2	211.4	218.9
65-74 years	69.3	92.9	117.2	142.9	174.6	205.3	212.5	219.2
75-84 years	69.3	88.2	102.9	129.2	175.1	212.4	226.2	237.3
85 years and over	64.0	65.8	79.1	97.1	113.5	142.8	152.5	156.3
White male								
All ages, age adjusted[3]	21.6	28.5	34.6	41.5	49.9	54.6	55.6	56.4
All ages, crude	24.1	32.5	39.6	47.5	58.3	65.8	67.9	69.6
Under 25 years	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
25-34 years	1.2	1.4	1.6	1.4	1.4	1.3	1.0	1.2
35-44 years	7.9	8.9	10.4	12.9	15.4	13.4	13.4	12.4
45-54 years	39.1	47.2	53.0	60.7	67.6	73.0	72.7	74.0
55-64 years	95.9	125.3	149.8	169.7	199.3	206.3	209.3	208.5
65 years and over	116.1	164.4	211.7	270.8	341.7	398.0	411.3	423.3
65-74 years	119.5	172.1	225.1	282.5	344.8	385.2	391.8	399.8
75-84 years	109.1	155.2	191.9	259.2	360.7	452.0	477.5	501.1
85 years and over	102.8	105.1	133.9	181.5	221.8	298.2	329.6	340.1
White female								
All ages, age adjusted[3]	4.6	4.6	5.1	6.8	10.1	13.8	14.8	15.6
All ages, crude	5.4	5.7	6.4	8.6	13.1	18.8	20.5	21.7
Under 25 years	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1
25-34 years	0.5	0.6	0.6	0.6	0.6	0.5	0.7	0.6
35-44 years	2.2	2.6	3.4	4.5	6.0	7.1	6.7	7.1
45-54 years	6.5	6.8	9.8	14.8	22.1	27.7	29.1	30.8
55-64 years	15.5	14.8	16.7	23.4	39.3	58.9	63.0	65.3
65 years and over	31.6	31.2	30.6	36.7	50.0	69.6	77.3	81.5
65-74 years	27.2	26.7	26.5	33.1	45.4	68.1	76.3	80.9
75-84 years	40.0	39.1	36.5	41.1	56.8	71.3	79.4	83.6
85 years and over	43.9	42.7	45.2	51.2	57.4	73.1	76.4	78.8

See footnotes at end of table.

Table 18. Death rates for cancer of the respiratory system, according to race, sex, and age: United States, selected years 1950-77—Continued

(Data are based on the national vital registration system)

Race, sex, and age	*Year*							
	1950	*1955*	*1960*	*1965*	*1970*[1]	*1975*[1]	*1976*[1]	*1977*[1]
All other male[4]	*Number of deaths per 100,000 resident population*							
All ages, age adjusted[3]	17.0	24.0	35.6	42.6	56.3	66.8	68.2	71.4
All ages, crude	14.5	20.6	30.5	36.0	47.6	56.7	58.3	61.5
Under 25 years	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.2
25-34 years	2.1	2.2	2.5	1.7	2.4	1.6	1.5	2.1
35-44 years	9.3	12.9	19.8	24.5	29.3	27.3	23.8	24.6
45-54 years	40.5	56.3	70.4	84.7	113.1	122.9	129.0	131.2
55-64 years	79.1	108.0	154.2	171.0	231.5	290.0	295.4	305.0
65 years and over	60.7	93.7	170.2	219.6	285.3	358.4	369.1	397.3
65-74 years	67.6	100.6	183.4	240.2	301.2	378.2	384.3	408.4
75-84 years	48.5	83.2	145.4	177.8	278.7	346.9	372.2	412.0
85 years and over	10.5	45.8	114.8	147.1	158.8	218.8	223.5	252.8
Black male:								
All ages, age adjusted[3]	16.9	—	36.6	44.7	60.8	72.5	73.8	78.3
All ages, crude	14.3	—	31.1	37.6	51.2	61.8	63.3	67.8
Under 25 years	0.2	—	0.1	0.2	0.2	0.1	0.1	0.2
25-34 years	2.1	—	2.6	1.8	2.9	1.6	1.5	2.3
35-44 years	9.4	—	20.7	26.1	32.6	30.7	26.7	27.6
45-54 years	41.1	—	75.0	90.4	123.5	136.9	142.6	147.5
55-64 years	78.8	—	161.8	182.7	250.3	313.2	319.4	331.9
65 years and over	58.9	—	166.4	224.0	302.9	383.3	394.0	430.4
65-74 years	65.2	—	184.6	248.1	322.2	404.7	408.8	435.9
75-84 years	42.4	—	126.3	172.6	290.6	370.7	401.5	469.6
85 years and over		—	110.3	140.0	154.4	220.8	226.8	255.0
All other female[5]								
All ages, age adjusted[3]	4.1	5.2	5.6	7.1	10.4	13.4	14.3	15.7
All ages, crude	3.4	4.5	4.9	6.3	9.5	12.5	13.4	14.7
Under 25 years	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1
25-34 years	1.1	0.7	0.7	0.9	0.5	0.7	0.8	0.9
35-44 years	2.6	3.3	3.5	6.1	9.4	8.4	8.3	10.5
45-54 years	8.7	10.9	12.5	16.7	23.3	30.7	34.4	36.4
55-64 years	15.5	19.6	20.2	25.8	35.3	52.3	54.7	63.3
65 years and over	18.3	25.0	27.2	29.3	49.0	62.6	66.0	66.9
65-74 years	17.8	25.2	22.5	29.5	47.7	62.9	65.8	70.1
75-84 years	19.6	25.0	35.8	27.7	53.2	64.4	70.1	65.6
85 years and over	19.2	23.5	44.7	34.7	45.8	55.5	56.2	50.8

See footnotes at end of table.

Table 18. Death rates for cancer of the respiratory system, according to race, sex, and age: United States, selected years 1950-77—Continued

(Data are based on the national vital registration system)

Race, sex, and age	1950	1955	1960	1965	1970[1]	1975[1]	1976[1]	1977[1]
Black female:	*Number of deaths per 100,000 resident population*							
All ages, age adjusted[3]	4.1	—	5.5	7.1	10.9	14.2	15.2	16.7
All ages, crude	3.4	—	4.9	6.3	10.1	13.4	14.5	15.8
Under 25 years	0.1	—	0.1	0.1	0.1	0.0	0.0	0.0
25-34 years	1.2	—	0.8	0.9	0.5	0.7	0.8	1.1
35-44 years	2.7	—	3.4	6.3	10.5	9.5	9.1	11.8
45-54 years	8.8	—	12.8	17.6	25.3	33.6	38.4	41.0
55-64 years	15.3	—	20.7	26.0	36.4	55.0	57.9	66.0
65 years and over	17.2	—	25.3	27.3	50.0	63.2	66.6	67.1
65-74 years	16.4	—	20.7	28.2	49.3	63.7	66.3	71.3
75-84 years	19.2	—	33.1	24.5	52.6	65.5	73.9	65.6
85 years and over		—	44.7	30.4	47.6	53.5	49.5	45.4

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[1] Excludes deaths of nonresidents of the United States.

[2] Includes all races and both sexes.

[3] Age adjusted by the direct method to the total population of the United States as enumerated in 1940, using 11 age groups.

[4] Includes black males.

[5] Includes black females.

NOTE: The *International Classification of Diseases, Adapted for Use in the United States* revisions and code numbers for cancer of the respiratory system are *Sixth Revision*, Nos. 160-164, for 1950 and 1955; *Seventh Revision*, Nos. 160-164, for 1960 and 1965; and *Eighth Revision*, Nos. 160-163, for 1970-77.

SOURCES: National Center for Health Statistics: *Vital Statistics of the United States*, Vol. II, 1950-77. Public Health Service. Washington. U.S. Government Printing Office; Data computed by the Division of Analysis from data compiled by the Division of Vital Statistics; U.S. Bureau of the Census: Population estimates and projections. *Current Population Reports*. Series P-25, Nos. 310, 519, 643, and 721. Washington. U.S. Government Printing Office, June 1965. Apr. 1974, Jan. 1977, and Apr. 1978; *1950 Nonwhite Population by Race*. Special report P-E No. 38. Washington. U.S. Government Printing Office, 1951; General population characteristics, United States summary, 1960 and 1970, *U.S. Census of Population*. Final reports PC(1)-1B and PC(1)-B1, Washington. U.S. Government Printing Office, 1961 and 1972.

Table 19. Infants weighing 2,500 grams or less at birth, according to color or race, geographic division, and State: United States average annual 1965-67, 1970-72, and 1975-77

(Data are based on the national vital registration system)

Geographic division and State	1965-67			1970-72			1975-77		
	Total	White	All other[1]	Total[2]	White	Black	Total[2]	White	Black
	Infants weighing 2,500 grams or less at birth per 100 total live births								
United States	8.3	7.2	13.7	7.8	6.6	13.6	7.2	6.1	13.3
New England	7.9	7.6	14.2	7.2	6.8	14.1	6.6	6.2	12.3
Maine	7.4	7.4	13.2	6.8	6.7	*9.3	5.7	5.7	*6.7
New Hampshire	7.6	7.5	*9.3	6.8	6.7	*10.0	6.2	6.2	*7.7
Vermont	7.8	7.8	*2.7	7.1	7.0	*14.5	6.5	6.5	*12.5
Massachusetts	7.8	7.5	13.3	7.2	6.8	13.6	6.5	6.2	11.1
Rhode Island	8.3	7.9	14.7	7.3	6.7	17.2	6.8	6.4	13.2
Connecticut	8.4	7.7	15.1	7.6	6.8	14.3	7.0	6.2	13.7
Middle Atlantic	8.6	7.4	15.5	8.2	6.9	14.4	7.7	6.4	13.4
New York	9.0	7.7	15.2	8.4	7.2	14.2	8.0	6.6	13.2
New Jersey	8.4	7.1	15.0	8.1	6.7	14.6	7.6	6.2	13.6
Pennsylvania	8.1	7.0	16.6	7.7	6.7	14.8	7.2	6.2	13.9
East North Central	7.8	6.9	14.5	7.5	6.4	13.9	7.0	5.9	13.4
Ohio	7.9	7.1	15.0	7.5	6.6	13.8	7.0	6.1	13.2
Indiana	7.6	6.9	14.0	6.9	6.4	12.1	6.5	5.8	11.9
Illinois	8.2	6.8	14.4	8.0	6.4	14.2	7.6	5.9	13.8
Michigan	7.9	6.9	14.6	7.8	6.5	14.4	7.4	6.1	13.7
Wisconsin	6.9	6.5	13.5	6.4	6.1	12.5	5.8	5.3	12.6
West North Central	6.9	6.4	13.1	6.6	6.1	13.3	6.1	5.6	13.2
Minnesota	6.3	6.2	9.7	6.1	5.9	12.5	5.4	5.2	12.0
Iowa	6.2	6.1	13.3	6.1	5.9	12.9	5.6	5.5	10.8
Missouri	7.9	6.6	14.7	7.5	6.4	13.5	7.1	5.9	13.7
North Dakota	6.4	6.4	7.0	5.7	5.7	10.1	5.2	5.0	11.8
South Dakota	6.3	6.1	7.4	6.0	5.9	*9.4	5.5	5.3	*8.7
Nebraska	6.8	6.5	12.8	6.6	6.3	12.8	5.8	5.5	11.9
Kansas	7.0	6.6	12.9	6.8	6.3	12.7	6.5	5.9	13.4
South Atlantic	9.4	7.5	13.7	8.7	6.9	13.5	8.2	6.3	12.9
Delaware	9.0	7.3	15.7	8.3	6.4	15.5	7.9	6.2	13.8
Maryland	9.2	7.5	15.1	8.1	6.5	13.4	7.9	5.9	13.2
District of Columbia	13.0	7.4	14.5	12.6	7.1	13.5	12.6	6.6	13.8
Virginia	8.9	7.4	13.4	8.3	6.8	13.6	7.5	6.1	12.4
West Virginia	8.4	8.2	13.7	7.8	7.5	13.2	7.1	7.0	10.8
North Carolina	9.4	7.7	13.3	8.9	7.0	13.9	8.3	6.3	12.9
South Carolina	9.7	7.6	12.7	9.1	6.8	12.9	9.0	6.3	13.0
Georgia	9.6	7.3	13.7	9.1	7.0	13.5	8.7	6.4	12.9
Florida	9.2	7.5	13.7	8.4	6.8	13.1	7.9	6.3	12.7
East South Central	9.0	7.4	13.0	8.5	6.9	12.8	8.0	6.4	12.3
Kentucky	8.3	7.7	14.2	7.8	7.2	13.4	7.2	6.6	12.6
Tennessee	9.1	7.5	14.9	8.3	6.9	13.6	7.9	6.5	12.9
Alabama	9.0	7.1	12.4	8.7	6.7	12.7	8.2	6.2	11.9
Mississippi	9.7	6.8	12.3	9.3	6.6	12.4	9.1	6.3	12.3

See footnotes at end of table.

Table 19. Infants weighing 2,500 grams or less at birth, according to color or race, geographic division, and State: United States average annual 1965-67, 1970-72, and 1975-77—Continued

(Data are based on the national vital registration system)

Geographic division and State	1965-67			1970-72			1975-77		
	Total	White	All other[1]	Total[2]	White	Black	Total[2]	White	Black
	Infants weighing 2,500 grams or less at birth per 100 total live births								
West South Central	8.7	7.3	13.8	8.2	6.8	13.6	7.8	6.5	13.2
Arkansas	8.8	7.4	12.1	7.9	6.6	12.0	8.0	6.4	12.7
Louisiana	10.1	7.1	14.6	9.3	6.7	13.6	8.9	6.3	12.8
Oklahoma	7.7	7.0	11.4	7.7	7.0	14.9	7.6	6.8	13.3
Texas	8.4	7.4	14.0	8.0	6.9	13.9	7.5	6.5	13.5
Mountain	8.8	8.5	11.1	7.9	7.7	14.3	7.1	6.9	13.3
Montana	8.0	8.0	8.5	7.5	7.5	14.9	6.7	6.5	*10.0
Idaho	7.2	7.2	10.0	6.5	6.5	*5.7	5.7	5.7	*6.9
Wyoming	9.2	9.0	12.9	9.1	8.9	18.8	8.7	8.5	16.4
Colorado	10.4	10.1	15.8	9.4	9.1	15.2	8.7	8.4	14.6
New Mexico	10.1	10.0	11.0	9.2	9.2	15.4	8.4	8.5	12.5
Arizona	7.8	7.4	9.9	7.0	6.8	11.9	6.4	6.2	11.7
Utah	7.1	7.0	10.6	6.4	6.3	10.8	5.4	5.4	15.1
Nevada	9.5	8.9	13.0	9.1	8.1	16.8	7.5	6.7	13.8
Pacific	7.4	6.7	11.3	6.6	6.0	12.3	6.1	5.4	11.5
Washington	6.8	6.5	10.9	6.4	6.1	12.6	5.6	5.3	9.8
Oregon	6.3	6.1	10.8	5.9	5.7	14.0	5.4	5.3	11.6
California	7.5	6.8	12.0	6.7	6.0	12.2	6.1	5.5	11.6
Alaska	7.1	6.3	8.7	6.3	6.0	10.3	5.4	5.0	9.1
Hawaii	9.0	7.5	9.6	8.1	6.4	11.6	7.6	6.0	9.3

[1] Data by birth weight for the black population not available for these years. In the Middle Atlantic, East North Central, South Atlantic, East South Central, and West South Central divisions, more than 95 percent of the births in the "all other" color category were black. However, in the Mountain and Pacific States most of the births in the "all other" color category were not black. Overall, 91 percent of the births in the "all other" color category were black for the 3-year period. Based on more recent data, infants other than black of the "all other" color category have a much lower low-birth-weight ratio than black infants. In fact, this other group's ratio is similar to the white ratio. Therefore, combining the black and other groups distorts the picture, making a trend difficult to interpret.

[2] Includes all other races not shown separately.

SOURCE: National Center for Health Statistics: Data computed by the Division of Analysis from data compiled by the Division of Vital Statistics.

Table 20. Live births, according to month of pregnancy prenatal care began and race: United States, reporting areas, 1970-78

(Data are based on the national vital registration system)

Race and year	*All live births*	*Month of pregnancy prenatal care began* *1st or 2nd month*	*3rd month*	*4th month*	*5th month*	*6th month*	*7th month*	*8th month*	*9th month*	*No prenatal care*
Total[1]					*Percent distribution*					
1970	100.0	41.2	26.7	12.1	7.3	4.8	3.4	2.0	0.8	1.7
1971	100.0	41.4	27.2	12.2	7.2	4.7	3.1	1.8	0.7	1.6
1972	100.0	42.4	27.0	12.0	7.1	4.5	3.0	1.7	0.7	1.6
1973	100.0	43.8	27.0	11.6	6.8	4.2	2.8	1.7	0.7	1.5
1974	100.0	44.9	27.2	11.4	6.4	3.9	2.6	1.6	0.6	1.4
1975	100.0	45.5	26.8	11.4	6.3	3.9	2.6	1.5	0.6	1.3
1976	100.0	46.7	26.7	11.0	6.1	3.7	2.4	1.4	0.6	1.4
1977	100.0	47.4	26.6	10.9	6.0	3.5	2.3	1.3	0.5	1.4
1978	100.0	49.0	25.9	10.6	5.7	3.4	2.2	1.3	0.5	1.4
White										
1970	100.0	44.5	27.9	11.3	6.2	3.9	2.7	1.6	0.7	1.2
1971	100.0	44.7	28.3	11.3	6.1	3.8	2.6	1.5	0.6	1.1
1972	100.0	45.7	27.9	11.1	6.0	3.7	2.4	1.4	0.6	1.1
1973	100.0	47.1	27.8	10.6	5.7	3.4	2.3	1.4	0.6	1.1
1974	100.0	48.0	27.9	10.4	5.4	3.2	2.2	1.3	0.5	1.0
1975	100.0	48.5	27.4	10.5	5.4	3.2	2.2	1.3	0.5	1.0
1976	100.0	49.6	27.2	10.1	5.2	3.1	2.0	1.2	0.5	1.1
1977	100.0	50.2	27.1	10.0	5.1	2.9	1.9	1.1	0.5	1.1
1978	100.0	51.9	26.3	9.7	4.9	2.8	1.9	1.1	0.5	1.1
Black										
1970	100.0	23.7	20.6	16.2	13.1	9.8	6.9	3.8	1.5	4.4
1971	100.0	24.8	21.8	16.5	13.0	9.2	6.1	3.3	1.2	4.0
1972	100.0	26.4	22.6	16.7	12.5	8.5	5.5	3.0	1.1	3.6
1973	100.0	28.2	23.2	16.3	11.9	7.9	5.0	2.8	1.2	3.4
1974	100.0	30.1	23.8	16.1	11.3	7.3	4.7	2.6	1.1	3.0
1975	100.0	31.6	24.2	16.0	10.8	6.9	4.4	2.4	1.0	2.7
1976	100.0	33.2	24.5	15.7	10.3	6.4	3.9	2.2	0.9	2.9
1977	100.0	34.4	24.6	15.3	10.0	6.1	3.8	2.2	0.8	2.8
1978	100.0	36.0	24.2	14.9	9.7	5.9	3.6	2.0	0.9	2.9

[1] Includes all other races not shown separately.

NOTE: In 1970 and 1971, month of pregnancy prenatal care began was reported by 39 States and the District of Columbia; in 1972, by 40 States and the District of Columbia; in 1973-75, by 42 States and the District of Columbia; in 1976-78, by 44 States and the District of Columbia. Figures for 1970 and 1971 are based on a 50-percent sample of births; for 1972-78, they are based on 100 percent of births in selected States and on a 50-percent sample of births in all other States. Percents are based only on records for which month of pregnancy prenatal care began is stated.

SOURCE: National Center for Health Statistics: *Vital Statistics of the United States*, Vol. I, for data years 1970-1975, Public Health Service. Washington. U.S. Government Printing Office; for data years 1976-1978, Public Health Service, DHHS, Hyattsville, Md. To be published.

Table 21. Infants born to ever-married women 15-44 years of age and percent breast fed, according to selected maternal characteristics: United States, 1970-72 and 1973-75

Maternal characteristics	*Year of infant's birth*			
	1970-72		*1973-75*	
	Number of infants in thousands	*Percent of infants breast fed*	*Number of infants in thousands*	*Percent of infants breast fed*
Total[1]	9,339	24.5	8,662	31.2
Education				
Less than 12 years	2,860	17.3	2,278	18.7
12 years	4,556	22.0	4,072	28.1
More than 12 years	1,923	41.2	2,295	48.9
Poverty level income				
Less than 150 percent of poverty income	2,534	23.8	2,102	23.6
150-299 percent of poverty income	4,060	21.2	3,431	31.3
300 percent or more of poverty income	2,745	30.0	2,206	39.3
Race				
White	8,145	25.8	7,485	32.9
Black	1,070	13.0	969	19.6
Employment history				
Never worked	590	21.7	820	23.1
Ever worked	8,749	24.7	7,647	32.2

[1] Includes all other races not shown separately. For 1973-75, includes births to women whose education, poverty level, and employment history were not stated.

NOTE: Only infants who resided with their mother for 2 months or more are included.

SOURCE: Division of Vital Statistics, National Center for Health Statistics: Data from the National Survey of Family Growth.

Table 22. Immunization and infection status of children 1-4 years of age: United States, 1970-79

(Data are based on household interviews of a sample of the civilian noninstitutionalized population)

Year	Population 1-4 years in thousands	History of—								
		Measles		Rubella		DTP[1] vaccination		Polio vaccination		Mumps vaccination
		Infection	Vaccination	Infection	Vaccination	3 doses or more	0 doses	3 doses or more	0 doses	
		Percent of population								
1970	14,123	8.1	57.2	14.4	37.2	76.1	7.0	65.9	10.8	([2])
1971	14,112	8.7	61.0	13.9	51.2	78.7	5.8	67.3	8.6	([2])
1972	13,905	7.4	62.2	12.3	56.9	75.6	6.9	62.9	10.7	([2])
1973	13,874	6.3	61.2	12.8	55.6	72.6	6.2	60.4	13.9	34.7
1974	13,210	5.1	64.5	12.2	59.8	73.9	5.2	63.1	11.7	39.4
1975	12,729	4.8	65.5	11.3	61.9	75.2	4.5	64.8	10.3	44.4
1976[3]	12,276	4.3	65.9	10.0	61.7	71.4	3.7	61.6	9.5	48.3
1977	12,071	3.8	63.1	10.0	59.4	69.5	3.3	60.1	8.7	48.1
1978	12,187	3.3	62.8	7.8	61.7	68.0	3.8	61.4	7.9	51.1
1979	12,386	3.1	63.5	7.0	62.7	65.4	2.6	59.1	6.0	55.4

[1] Diptheria-tetanus-pertussis.

[2] Mumps vaccination was first reported in 1973.

[3] Beginning in 1976, the category "don't know" was added to response categories. Prior to 1976, the lack of the "don't know" option resulted in some forced positive answers which were particularly apparent for those vaccinations which require multiple dose schedules, i.e., polio and DTP.

NOTE: The proportions of the population ever infected or vaccinated are not mutually exclusive.

SOURCE: Center for Disease Control: *United States Immunization Survey, 1979*. Public Health Service, DHHS, Atlanta, Ga. To be published.

Table 23. Selected notifiable disease rates, according to disease: United States, selected years 1950-78

(Data are based on reporting by State health departments)

Disease	Year							
	1950	*1955*	*1960*	*1965*	*1970*	*1975*	*1977*	*1978*
	Number of cases per 100,000 population							
Chickenpox	(1)	(1)	(1)	(1)	(1)	78.11	97.63	80.42
Diphtheria	3.83	1.21	0.51	0.08	0.21	0.14	0.04	0.03
Hepatitis A	(1)	19.45	23.15	17.49	27.87	16.82	14.40	13.53
Hepatitis B					4.08	6.30	7.78	6.89
Measles (rubeola)	211.01	337.88	245.42	135.33	23.23	11.44	26.51	12.32
Mumps	(1)	(1)	(1)	(1)	55.55	27.99	10.02	7.81
Pertussis (whooping cough)	79.82	38.21	8.23	3.51	2.08	0.82	1.02	0.95
Poliomyelitis, total	22.02	17.64	1.77	0.04	0.02	0.00	0.01	0.01
Paralytic		8.43	1.40	0.03	0.02	0.00	0.01	0.00
Rubella (German measles)	(1)	(1)	(1)	(1)	27.75	7.81	9.43	8.38
Salmonellosis, excluding typhoid fever	(1)	3.32	3.85	8.87	10.84	10.61	12.87	13.49
Shigellosis	15.45	8.47	6.94	5.70	6.79	7.78	7.42	8.95
Tuberculosis[2]	80.50	46.60	30.83	25.33	18.22	15.95	13.93	13.08
Venereal diseases[3]:								
Syphilis[4]	146.02	76.15	68.78	58.81	45.46	38.00	30.10	30.00
Primary and secondary	16.73	4.02	9.06	12.16	10.94	12.09	9.50	10.00
Early latent	39.71	12.48	10.11	9.10	8.11	12.57	9.94	9.07
Late and late latent	76.22	53.83	45.91	35.09	25.05	12.81	10.39	10.64
Congenital	8.97	3.33	2.48	1.86	0.97	0.43	0.22	0.20
Gonorrhea	192.45	146.96	145.33	169.36	298.52	472.91	466.83	468.30
Chancroid	3.34	1.65	0.94	0.51	0.70	0.33	0.21	0.24
Granuloma inguinale	1.19	0.30	0.17	0.08	0.06	0.03	0.03	0.03
Lymphogranuloma venereum	0.95	0.47	0.47	0.46	0.30	0.17	0.16	0.13

[1] Not reported nationally.

[2] Newly reported active cases.

[3] Newly reported civilian cases.

[4] Includes stage of syphilis not stated.

NOTE: Rates greater than 0 but less than 0.005 are shown as 0.00. The total resident population was used to calculate all rates except venereal diseases, for which the civilian resident population was used.

SOURCES: Center for Disease Control: Reported morbidity and mortality in the United States, 1978, *Morbidity and Mortality Weekly Report* 27(54). Public Health Service, Atlanta, Ga., Sept. 1979; National Center for Health Statistics: Data computed by the Division of Analysis from data compiled by the Center for Disease Control; Venereal Disease Control Division, Center for Disease Control: Selected data.

Table 24. Self-assessment of health and limitation of activity, according to selected characteristics: United States, 1973 and 1978

(Data are based on household interviews of a sample of the civilian noninstitutionalized population)

Characteristic	*Self-assessment of health as fair or poor*		*With limitation of activity*							
			Total		*Limited but not in major activity*		*Limited in amount or kind of major activity*		*Unable to carry on major activity*	
	1973	*1978*	*1973*	*1978*	*1973*	*1978*	*1973*	*1978*	*1973*	*1978*
	Percent of population									
Total[1,2,3]	12.2	11.9	13.3	13.6	3.3	3.5	7.0	6.8	3.1	3.3
Age										
Under 17 years	4.2	4.4	3.4	3.9	1.5	1.9	1.6	1.8	0.2	0.2
17-44 years	8.5	8.5	8.5	8.5	3.1	3.2	4.4	4.2	1.0	1.0
45-64 years	22.3	21.6	23.3	23.6	4.9	5.0	13.2	12.4	5.2	6.1
65 years and over	31.5	30.1	44.1	45.0	6.4	6.7	21.7	21.7	16.1	16.6
Sex[1]										
Male	11.3	11.3	14.0	14.4	3.3	3.4	5.6	5.5	5.0	5.5
Female	12.9	12.5	12.7	13.0	3.1	3.6	8.0	7.8	1.5	1.5
Race[1]										
White	11.1	10.9	13.0	13.3	3.3	3.6	6.8	6.6	2.8	3.1
Black	21.0	20.5	16.8	17.1	2.8	2.9	8.7	8.7	5.4	*5.5
Family income[1,4]										
Less than $7,000	22.1	21.9	21.1	21.2	4.0	4.0	10.8	10.8	6.3	6.5
$7,000-$9,999	15.4	15.0	15.4	16.3	3.3	3.8	8.5	7.7	*3.6	*4.7
$10,000-$14,999	12.2	11.2	12.6	12.8	2.9	3.3	7.1	6.6	*2.6	*2.9
$15,000-$24,999	9.7	8.3	11.1	11.3	3.2	3.4	5.8	5.8	2.3	*2.1
$25,000 or more	6.3	6.1	9.5	9.8	3.1	3.5	4.7	4.6	*1.7	*1.7
Geographic region[1]										
Northeast	10.0	10.6	12.1	12.8	2.8	3.3	6.6	6.4	2.7	*3.0
North Central	10.9	10.7	12.6	12.8	3.5	3.2	6.4	6.9	2.6	*2.6
South	15.4	14.7	14.5	14.2	3.1	3.2	7.7	7.0	3.7	4.0
West	11.2	10.6	14.1	15.0	4.0	4.6	7.0	6.8	*3.1	*3.6
Location of residence[1]										
Within SMSA	11.1	11.2	12.9	13.1	3.3	3.5	6.7	6.5	2.9	3.1
Outside SMSA	14.3	13.5	14.2	14.7	3.3	3.6	7.5	7.4	3.5	3.7

[1] Age adjusted by the direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

[2] Includes all other races not shown separately.

[3] Includes unknown family income.

[4] Family income categories for 1978. Corresponding income categories in 1973, adjusting for inflation, were: less than $5,000; $5,000-$6,999; $7,000-$9,999; $10,000-$14,999; and $15,000 or more.

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

Table 25. Restricted-activity and bed-disability days, according to selected characteristics: United States, 1973 and 1978

(Data are based on household interviews of a sample of the civilian noninstitutionalized population)

Characteristic	Restricted-activity days		Bed-disability days	
	1973	1978	1973	1978
	Number per person per year			
Total[1,2,3]	16.4	18.4	6.3	7.0
Age				
Under 17 years	10.7	11.3	4.5	5.2
17-44 years	13.6	14.8	5.4	5.7
45-64 years	22.6	25.8	7.8	8.8
65 years and over	33.5	40.3	13.1	14.5
Sex[1]				
Male	15.0	16.4	5.4	6.1
Female	17.6	20.1	7.2	7.9
Race[1]				
White	15.9	17.9	6.1	6.8
Black	21.3	22.9	8.9	9.9
Family income[1,4]				
Less than $7,000	25.5	28.8	9.7	11.0
$7,000-$9,999	17.4	21.1	6.6	8.5
$10,000-$14,999	15.9	16.1	6.4	5.9
$15,000-$24,999	14.0	15.4	5.6	5.9
$25,000 or more	13.2	13.3	5.1	5.3
Geographic area[1]				
Northeast	13.6	17.3	5.4	6.9
North Central	15.4	16.8	5.8	6.4
South	18.5	19.1	7.4	7.5
West	18.2	20.7	6.7	7.5
Location of residence[1]				
Within SMSA	16.3	18.5	6.4	7.2
Outside SMSA	16.5	17.8	6.1	6.6

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[1] Age adjusted by the direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

[2] Includes all other races not shown separately.

[3] Includes unknown family income.

[4] Family income categories for 1978. Corresponding income categories in 1973, adjusting for inflation, were: less than $5,000; $5,000-$6,999; $7,000-$9,999; $10,000-$14,999; and $15,000 or more.

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics. Data from the National Health Interview Survey.

Table 26. Disability days associated with acute conditions and incidence of acute conditions, according to age: United States, 1970-78

(Data are based on household interviews of a sample of the civilian noninstitutionalized population)

Age	Year ending June 30								
	1970	*1971*	*1972*	*1973*	*1974*	*1975*	*1976*	*1977*	*1978*
Restricted-activity days	*Number per person*								
All ages[1]	8.5	8.6	9.3	9.2	9.3	9.7	9.4	9.4	9.8
Under 17 years	8.6	9.5	9.4	9.3	9.9	9.4	9.7	10.0	10.0
17-44 years	8.0	8.0	8.8	8.9	8.9	9.4	8.8	9.1	9.5
45-64 years	8.7	7.2	9.3	8.6	8.2	9.8	9.1	8.6	8.8
65 years and over	9.8	10.3	10.9	10.8	10.7	12.1	11.6	10.1	12.1
Bed-disability days[2]									
All ages[1]	3.8	3.8	4.1	4.0	4.0	4.2	4.2	4.2	4.5
Under 17 years	4.0	4.5	4.3	4.1	4.5	4.0	4.6	4.8	5.0
17-44 years	3.5	3.6	3.9	4.0	3.8	4.2	4.0	3.9	4.3
45-64 years	3.8	3.1	3.6	3.6	3.5	4.0	3.8	3.7	3.6
65 years and over	4.0	4.0	4.7	4.3	4.1	5.3	4.7	4.5	5.1
Incidence of acute conditions	*Number per 100 persons*								
All ages[1]	204.1	209.8	220.9	[3]199.6	[3]174.2	[3]199.1	218.4	222.6	224.2
Under 17 years	290.3	310.6	307.9	280.1	254.8	282.6	305.7	315.0	310.6
17-44 years	193.2	194.2	215.1	196.0	170.2	194.7	215.3	216.1	222.3
45-64 years	132.8	125.3	144.0	124.6	98.3	123.4	136.7	142.2	143.0
65 years and over	103.0	105.6	109.2	98.1	75.7	91.3	105.5	102.4	111.0

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[1] Age adjusted by the direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

[2] A subset of restricted-activity days.

[3] The 1974 estimates are artificially low because of modifications in the questionnaire design for the 1973 and 1974 surveys. Since the data are collected on a calendar year basis, the 1973 and 1975 estimates are also partially affected.

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

Table 27. Cigarette smoking status of persons 20 years of age and over, according to sex, race, and age: United States, 1965, 1976, and 1979

(Data are based on household interviews of a sample of the civilian noninstitutionalized population)

Sex, race, and age	*1979 population in thousands*[1]	*Smoking status*					
		Current smoker[2]			*Former smoker*		
		1965	*1976*	*1979*	*1965*	*1976*	*1979*
MALE		*Percent of persons*					
Total[3,4]							
All ages, 20 years and over	67,836	52.4	41.9	37.8	20.5	28.9	30.0
20-24 years	9,040	59.2	45.9	37.1	9.0	12.2	12.6
25-34 years	16,561	60.7	48.5	43.8	14.7	18.3	20.3
35-44 years	11,943	58.2	47.6	42.0	20.6	27.3	28.3
45-64 years	20,675	51.9	41.3	39.1	24.1	37.1	38.0
65 years and over	9,616	28.5	23.0	20.1	28.1	44.4	47.9
White							
All ages, 20 years and over	60,191	51.5	41.2	37.1	21.4	30.0	31.2
20-24 years	7,859	58.1	45.3	35.8	9.6	13.3	13.3
25-34 years	14,582	60.1	47.7	43.6	15.5	18.9	20.9
35-44 years	10,466	57.3	46.8	41.3	21.5	28.9	30.0
45-64 years	18,627	51.3	40.6	38.5	25.1	38.1	39.1
65 years and over	8,657	27.7	22.8	19.3	28.7	45.6	49.3
Black							
All ages, 20 years and over	5,801	60.8	50.5	45.1	12.1	19.3	19.4
20-24 years	835	67.4	52.8	46.3	3.8	4.1	*4.7
25-34 years	1,458	68.4	59.4	48.1	6.7	11.8	14.9
35-44 years	1,080	67.3	58.8	49.0	12.3	13.8	15.6
45-64 years	1,653	57.9	49.7	47.4	15.3	28.6	25.9
65 years and over	774	36.4	26.4	27.9	21.5	33.0	35.1
FEMALE							
Total[3,4]							
All ages, 20 years and over	76,958	34.1	32.0	29.7	8.2	13.8	15.4
20-24 years	10,239	41.9	34.2	33.5	7.3	10.4	11.4
25-34 years	17,509	43.7	37.5	33.8	9.9	12.9	15.2
35-44 years	12,728	43.7	38.2	36.8	9.6	15.8	17.0
45-64 years	22,749	32.0	34.8	30.8	8.6	15.9	17.6
65 years and over	13,733	9.6	12.8	13.5	4.5	11.7	13.9
White							
All ages, 20 years and over	67,222	34.2	31.8	30.0	8.5	14.4	16.1
20-24 years	8,605	41.9	34.4	33.9	8.0	11.4	12.3
25-34 years	14,999	43.4	37.1	34.4	10.3	13.7	16.0
35-44 years	11,026	43.9	38.1	37.3	9.9	17.0	17.9
45-64 years	20,147	32.7	34.7	30.7	8.8	16.4	18.0
65 years and over	12,445	9.8	13.2	14.2	4.5	11.5	14.2

See footnotes at end of table.

Table 27. Cigarette smoking status of persons 20 years of age and over, according to sex, race, and age: United States, 1965, 1976, and 1979—Continued

(Data are based on household interviews of a sample of the civilian noninstitutionalized population)

Sex, race, and age	*1979 population in thousands*[1]	*Smoking status*					
		Current smoker[2]			*Former smoker*		
		1965	*1976*	*1979*	*1965*	*1976*	*1979*
Black		*Percent of persons*					
All ages, 20 years and over	7,664	34.4	35.1	30.7	6.0	9.9	10.6
20-24 years	1,252	44.2	34.9	31.8	2.5	5.0	*4.3
25-34 years	1,886	47.8	42.5	34.5	6.7	8.9	10.6
35-44 years	1,328	42.8	41.3	37.3	7.0	9.6	10.1
45-64 years	2,082	25.7	38.1	34.8	6.6	11.9	14.9
65 years and over	1,115	7.1	9.2	7.5	4.5	13.3	10.5

[1] Includes persons with unknown present smoking status.

[2] A current smoker is a person who has smoked at least 100 cigarettes and who now smokes; includes occasional smokers.

[3] Base of percent excludes persons with unknown smoking status.

[4] Includes all other races not shown separately.

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

Table 28. Cigarettes smoked per day by persons 20 years of age and over, according to sex, race, and age: United States, 1965, 1976, and 1979

(Data are based on household interviews of a sample of the civilian noninstitutionalized population)

Sex, race, and age	*1979 current smokers[1] in thousands*	*Cigarettes smoked per day*								
		Less than 15			*15-24*			*25 or more*		
		1965	*1976*	*1979*	*1965*	*1976*	*1979*	*1965*	*1976*	*1979*
MALE		*Percent of current smokers*								
Total[2,3]										
All ages, 20 years and over	25,451	28.3	24.2	24.3	46.3	44.8	41.6	25.4	31.0	34.1
20-24 years	3,341	34.9	31.6	30.3	49.7	49.9	49.7	15.4	18.5	20.0
25-34 years	7,209	25.7	25.5	25.7	50.0	45.8	43.2	24.3	28.7	31.1
35-44 years	4,967	23.7	19.6	20.2	44.8	41.2	36.5	31.5	39.2	43.3
45-64 years	8,016	26.7	18.5	19.9	45.3	44.1	39.8	28.0	37.4	40.3
65 years and over	1,919	47.1	39.1	37.8	39.0	42.7	42.2	13.8	18.2	20.0
White										
All ages, 20 years and over	22,179	25.9	21.4	20.6	46.8	44.9	42.4	27.4	33.7	37.0
20-24 years	2,806	32.3	27.5	25.4	50.8	52.8	52.6	16.9	19.7	21.9
25-34 years	6,323	22.8	22.1	22.1	51.1	46.5	44.5	26.1	31.4	33.4
35-44 years	4,285	21.3	17.2	16.1	44.8	40.4	35.9	33.9	42.5	48.0
45-64 years	7,107	24.6	16.2	16.8	45.4	43.3	40.0	30.0	40.4	43.2
65 years and over	1,657	44.6	37.5	35.1	40.3	42.2	43.5	15.1	20.4	21.4
Black										
All ages, 20 years and over	2,596	48.1	43.8	49.9	42.6	44.8	37.9	9.3	11.5	12.2
20-24 years	387	52.7	56.9	57.5	41.9	34.2	39.4	*5.3	*8.9	*3.1
25-34 years	699	47.8	46.0	51.4	41.7	43.5	34.9	10.5	10.5	13.6
35-44 years	529	42.5	38.5	43.9	45.5	44.8	40.6	12.0	16.7	15.5
45-64 years	765	46.9	35.9	45.9	43.7	50.8	39.1	9.4	13.3	14.9
65 years and over	216	64.9	53.0	59.7	31.9	47.0	33.6	*3.2	*-	*6.2
FEMALE										
Total[2,3]										
All ages, 20 years and over	22,765	43.6	36.5	33.2	42.2	43.8	44.0	14.2	19.6	22.8
20-24 years	3,422	48.4	43.1	39.2	41.9	42.4	42.8	9.7	14.5	18.0
25-34 years	5,884	41.4	34.3	31.3	43.1	45.2	44.3	15.5	20.5	24.4
35-44 years	4,657	39.1	33.8	28.4	43.7	44.4	46.1	17.1	21.8	25.5
45-64 years	6,952	44.4	34.3	31.9	42.0	44.2	43.5	13.6	21.5	24.6
65 years and over	1,849	62.6	49.3	45.5	31.0	38.9	42.0	6.4	11.8	12.5
White										
All ages, 20 years and over	20,043	41.0	33.2	29.5	43.9	45.2	45.8	15.1	21.6	24.7
20-24 years	2,911	45.3	39.3	34.2	44.4	44.3	44.8	10.4	16.4	21.0
25-34 years	5,123	37.9	30.6	27.7	45.4	46.8	46.0	16.7	22.6	26.3
35-44 years	4,088	36.2	29.5	25.0	45.3	45.4	48.0	18.4	25.1	26.9
45-64 years	6,161	42.4	32.0	27.8	43.2	45.1	45.1	14.5	23.0	27.0
65 years and over	1,760	61.5	45.7	43.8	31.8	41.7	43.5	6.8	12.6	12.7

See footnotes at end of table.

Table 28. Cigarettes smoked per day by persons 20 years of age and over, according to sex, race, and age: United States, 1965, 1976, and 1979

(Data are based on household interviews of a sample of the civilian noninstitutionalized population)

Sex, race, and age	1979 current smokers[1] in thousands	Cigarettes smoked per day								
		Less than 15			15-24			25 or more		
		1965	1976	1979	1965	1976	1979	1965	1976	1979
Black		Percent of current smokers								
All ages, 20 years and over	2,335	67.7	60.0	62.2	26.4	33.8	29.7	5.9	6.1	8.1
20-24 years	396	73.4	65.7	72.8	22.1	31.3	27.2	*4.5	*3.0	-
25-34 years	647	66.2	58.8	59.9	25.1	33.6	30.1	8.7	*7.7	*10.0
35-44 years	493	63.4	60.4	52.0	30.4	38.1	33.7	*6.2	*1.4	14.4
45-64 years	715	69.4	53.2	64.0	26.9	36.7	29.5	*3.6	10.1	*6.5
65 years and over	84	83.2	100.0	*76.2	*16.8	*-	*15.5	*-	*-	*8.3

[1] A current smoker is a person who has smoked at least 100 cigarettes and who now smokes; includes occasional smokers.

[2] Base of percent excludes unknown amount smoked.

[3] Includes all other races not shown separately.

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

Table 29. Teenage cigarette smoking, according to parental smoking status, sex, and age: United States, 1974 and 1979

(Data are based on telephone interviews of samples of the noninstitutionalized population)

Year, sex, and age	Parental smoking status			
	Both parents current smokers	*Father only current smoker*	*Mother only current smoker*	*Neither parent current smoker*
1974	*Percent of teenagers who are current smokers*			
Both sexes, 12-18 years	21.4	14.7	15.6	9.5
Male				
12-18 years	22.1	15.7	13.8	11.3
12-14 years	4.9	10.5	0.0	2.4
15-16 years	23.2	16.4	20.9	12.4
17-18 years	43.2	23.8	29.7	23.1
Female				
12-18 years	20.7	13.6	17.6	7.7
12-14 years	7.9	6.3	8.5	1.7
15-16 years	33.8	18.3	19.4	7.1
17-18 years	27.6	22.0	30.6	17.7
1979				
Both sexes, 12-18 years	14.3	10.3	11.7	6.1
Male				
12-18 years	13.5	8.5	9.9	5.6
12-14 years	3.9	2.7	4.2	0.5
15-16 years	21.3	12.9	5.9	6.0
17-18 years	20.0	15.1	25.6	12.6
Female				
12-18 years	15.1	12.2	13.7	6.5
12-14 years	5.0	4.3	3.3	1.6
15-16 years	17.4	11.8	13.6	6.8
17-18 years	33.3	22.1	32.4	13.9

NOTE: A current smoker is a person who smokes at least once a week.

SOURCE: Green, D.E.: *Teenage Smoking, Immediate and Long-Term Patterns.* Clinton Research Services. Contract No. 400-79-0010. Prepared for the National Institute of Education. Washington. U.S. Government Printing Office, Nov. 1979.

Table 30. Air pollution, according to source and type of pollutant: United States, selected years 1970-78

(Data are calculated emissions estimates)

Type of pollutant and year	Source					
	All sources	*Transportation*	*Stationary fuel combustion*	*Industrial processes*	*Solid waste*	*Other*
Particulate matter	*Emissions in 10^6 metric tons per year*					
1970	23.2	1.1	7.2	12.8	1.1	1.0
1975	14.6	1.0	5.1	7.4	0.5	0.6
1976	14.1	1.0	4.7	7.0	0.5	0.8
1977	13.6	1.2	4.8	6.4	0.5	0.7
1978	12.5	1.3	3.8	6.2	0.5	0.7
Sulfur oxides						
1970	29.8	0.7	22.7	6.2	0.1	0.1
1975	26.2	0.8	20.9	4.5	([1])	([1])
1976	27.4	0.8	22.2	4.4	([1])	([1])
1977	27.2	0.8	22.2	4.2	([1])	([1])
1978	27.0	0.8	22.1	4.1	([1])	([1])
Nitrogen oxides						
1970	19.9	7.4	11.3	0.7	0.3	0.2
1975	20.9	8.6	11.3	0.7	0.2	0.1
1976	22.5	9.0	12.5	0.7	0.1	0.2
1977	23.4	9.4	13.0	0.8	0.1	0.1
1978	23.3	9.4	12.9	0.8	0.1	0.1
Hydrocarbons						
1970	28.3	11.7	0.4	11.2	1.8	3.2
1975	25.3	10.8	0.3	11.1	0.9	2.2
1976	27.0	11.0	0.3	12.2	0.9	2.6
1977	27.1	11.0	0.3	12.6	0.9	2.3
1978	27.8	10.7	0.3	13.6	0.8	2.4
Carbon monoxide						
1970	102.6	80.6	1.5	7.7	6.5	6.3
1975	97.2	82.3	1.3	6.7	3.2	3.7
1976	102.9	85.4	1.2	7.1	3.1	6.1
1977	102.4	86.1	1.2	7.4	2.9	4.8
1978	102.1	85.5	1.2	7.6	2.7	5.1

[1] Emissions of less than 50,000 metric tons per year.

NOTE: Because of modifications in methodology and use of more refined emission factors, data from this table should not be compared with data in *Health, United States, 1979.*

SOURCE: Monitoring and Data Analysis Division: *National Air Pollutant Emission Estimates, 1970-1978.* EPA-450/4-80-002. U.S. Environmental Protection Agency. Research Triangle Park, N.C., Jan. 1980.

Table 31. Physician visits, according to source or place of care and selected patient characteristics: United States, 1973 and 1978

(Data are based on household interviews of a sample of the civilian noninstitutionalized population)

Characteristic	Source or place of care							
	All sources or places[1]		Doctor's office or clinic or group practice		Hospital outpatient department[2]		Telephone	
	1973	1978	1973	1978	1973	1978	1973	1978
	Visits per 1,000 population							
Total[3,4,5]	4,991.0	4,717.0	3,440.7	3,158.3	533.6	642.7	640.8	569.8
Age								
Under 17 years	4,184.6	4,108.3	2,595.1	2,579.5	494.9	554.6	778.5	689.8
17-44 years	5,045.9	4,528.3	3,486.7	2,995.4	553.4	652.8	581.6	495.1
45-64 years	5,454.5	5,286.2	4,019.3	3,688.3	553.2	751.8	538.9	498.5
65 years and over	6,542.3	6,294.2	4,911.0	4,618.6	547.7	669.3	615.9	599.4
Sex[3]								
Male	4,363.8	4,100.0	2,964.2	2,655.8	501.5	650.5	500.2	451.2
Female	5,552.5	5,280.9	3,870.8	3,617.7	562.2	637.7	767.1	675.0
Race[3]								
White	5,053.4	4,723.6	3,535.7	3,230.2	458.2	566.0	699.0	622.3
Black	4,723.6	4,859.4	2,833.5	2,788.7	1,145.0	1,188.8	*252.8	*245.8
Family income[3,6]								
Less than $7,000	5,435.2	5,587.2	3,343.9	3,264.7	883.5	1,060.0	528.0	549.1
$7,000-$9,999	4,752.1	4,891.4	3,374.2	3,213.2	562.2	836.1	464.6	515.1
$10,000-$14,999	4,848.7	4,673.0	3,455.3	3,061.4	486.9	657.4	627.5	620.7
$15,000-$24,999	5,092.4	4,671.1	3,466.7	3,249.7	508.5	522.0	751.3	654.1
$25,000 or more	5,142.2	4,591.1	3,588.3	3,330.8	457.9	435.3	721.8	*561.9
Geographic region[3]								
Northeast	4,904.6	4,874.3	3,206.8	3,001.3	626.1	753.7	633.6	694.0
North Central	5,022.3	4,593.6	3,514.6	3,163.2	470.3	564.5	727.4	613.0
South	4,829.0	4,470.0	3,326.2	3,067.8	529.4	589.2	581.3	436.5
West	5,351.1	5,164.7	3,858.3	3,525.5	514.9	721.5	620.0	594.3
Location of residence[3]								
Within SMSA	5,230.3	4,905.3	3,501.1	3,207.9	605.3	715.6	712.7	613.3
Outside SMSA	4,468.0	4,321.7	3,308.3	3,060.1	374.9	486.2	483.2	480.4

[1] Includes all other sources or places of care not shown separately.

[2] Includes hospital outpatient clinic or emergency room.

[3] Age adjusted by the direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

[4] Includes all other races not shown separately.

[5] Includes unknown family income.

[6] Family income categories for 1978. Corresponding income categories in 1973, adjusting for inflation, were: less than $5,000; $5,000-$6,999; $7,000-$9,999; $10,000-$14,999; and $15,000 or more.

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

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Table 32. Interval since last physician visit, according to selected patient characteristics: United States, 1973 and 1978

(Data are based on household interviews of a sample of the civilian noninstitutionalized population)

Characteristic	Population in thousands		Interval since last physician visit							
			Less than 1 year		1 year-less than 2 years		2-4 years		5 years or more	
	1973	1978	1973	1978	1973	1978	1973	1978	1973	1978
			Percent of population							
Total[1,2,3]	205,799	213,828	74.4	75.4	10.9	11.1	10.0	9.2	3.9	3.3
Age										
Under 17 years	63,997	59,012	73.0	75.8	13.5	13.4	9.8	7.7	2.5	1.8
17-44 years	79,016	88,627	76.2	74.3	10.5	11.3	9.6	10.2	2.9	3.0
45-64 years	42,534	43,403	72.6	74.5	9.3	9.2	11.2	10.2	6.2	5.1
65 years and over	20,253	22,788	76.5	79.8	6.5	6.2	9.3	8.1	7.2	5.2
Sex[1]										
Male	99,241	103,174	70.5	71.2	11.9	12.1	11.9	11.2	4.7	4.1
Female	106,558	110,655	78.0	79.2	9.9	10.1	8.2	7.2	3.2	2.5
Race[1]										
White	179,808	185,052	75.0	75.6	10.7	11.0	9.8	9.2	3.7	3.2
Black	23,702	25,695	70.9	75.1	11.4	11.6	10.6	8.1	5.0	3.4
Family income[1,4]										
Less than $7,000	34,909	39,581	73.2	75.4	10.0	10.1	10.2	9.2	5.3	3.7
$7,000-$9,999	21,541	20,444	71.1	73.9	11.3	11.1	11.9	9.9	4.9	4.0
$10,000-$14,999	30,081	36,882	73.8	74.5	11.6	11.4	10.0	9.9	3.9	3.5
$15,000-$24,999	50,927	53,894	75.4	76.7	11.0	10.9	9.7	8.8	3.3	2.8
$25,000 or more	53,541	42,336	77.7	77.5	10.3	11.0	8.7	8.3	2.7	2.4
Geographic region[1]										
Northeast	48,745	48,667	75.6	76.2	11.2	11.0	9.0	8.4	3.6	3.2
North Central	56,335	57,356	74.2	76.0	10.4	10.9	10.8	9.0	3.9	3.2
South	65,099	69,206	73.6	74.1	11.0	11.5	9.9	9.8	4.2	3.3
West	35,620	38,599	74.9	75.8	10.7	10.6	9.8	9.3	3.6	3.2
Location of residence[1]										
Within SMSA	141,736	146,441	75.7	76.4	10.5	10.8	9.4	8.6	3.5	3.0
Outside SMSA	64,063	67,387	71.7	73.2	11.7	11.6	11.0	10.4	4.7	3.9

[1] Age adjusted by the direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

[2] Includes all other races not shown separately.

[3] Includes unknown family income.

[4] Family income categories for 1978. Corresponding income categories in 1973, adjusting for inflation, were: less than $5,000; $5,000-$6,999; $7,000-$9,999; $10,000-$14,999; and $15,000 or more.

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

Table 33. Office visits to physicians, according to sex, age, selected principal diagnosis, and ICDA code: United States, 1973 and 1978

(Data are based on reporting by a sample of office-based physicians)

Age and principal diagnosis	*ICDA code*[1]	*Both sexes*		*Male*		*Female*	
		1973	*1978*	*1973*	*1978*	*1973*	*1978*
		Visits per 1,000 population					
All ages[2,3]	...	2,842.0	2,718.5	2,360.4	327.9	3,280.0	3,081.5
Medical or special exams	Y00	171.2	206.2	147.2	173.2	193.8	237.1
Acute URI,[4] except influenza	460-465	209.0	175.0	194.2	161.2	222.5	188.1
Prenatal care	Y06	106.1	95.9	-	-	206.0	186.8
Medical and surgical aftercare[5]	Y10	144.3	49.1	138.9	42.0	149.6	56.2
Diseases of the heart	390-398, 402, 404, 410-414, 420-429	107.7	92.2	119.0	112.8	97.8	74.7
Hypertension	400, 401, 403	101.4	109.4	79.5	101.0	119.4	114.7
Under 15 years[3]	...	1,976.0	2,160.1	2,042.5	2,208.5	1,906.8	2,109.7
Medical or special exams	Y00	288.9	377.7	291.3	373.0	286.4	382.6
Acute URI,[4] except influenza	460-465	339.5	325.1	353.4	322.8	325.0	327.5
Diseases of ear and mastoid process	380-389	141.6	237.2	163.5	248.4	118.7	225.5
Infections and inflammations of skin	680-698	102.4	122.6	116.2	122.9	88.0	122.3
Bronchitis, emphysema, asthma	490-493	73.4	96.4	79.6	115.4	67.0	76.6
Medical and surgical aftercare[5]	Y10	81.9	23.2	96.5	24.2	66.7	22.1
15-44 years[3]	...	2,710.9	2,496.8	1,852.0	1,778.1	3,520.1	3,178.2
Acute URI,[4] except influenza	460-465	172.6	131.4	134.2	103.8	208.7	157.4
Medical or special exams	Y00	160.7	167.5	108.3	105.9	210.1	225.9
Medical and surgical aftercare[5]	Y10	129.9	50.2	104.5	36.8	153.9	62.9
Prenatal care	Y06	257.2	232.7	-	-	499.4	453.3
Neuroses and nonpsychotic disorders	300-309	144.2	117.2	97.0	97.0	188.6	136.3
Sprains and strains	840-848	94.6	90.6	110.4	106.3	79.6	75.8
45-64 years[3]	...	3,498.7	3,276.7	2,958.6	2,787.6	3,985.2	3,724.1
Diseases of the heart	390-398, 402, 404, 410-414, 420-429	198.5	177.0	240.8	235.0	160.4	123.9
Hypertension	400,401,403	236.8	271.5	193.7	260.8	275.6	281.2
Arthritis and rheumatism	710-718	169.7	155.6	113.8	111.7	220.1	195.7
Medical and surgical aftercare[5]	Y10	201.4	72.7	190.0	51.4	211.6	92.2
Bronchitis, emphysema, asthma	490-493	107.7	92.3	86.6	78.6	126.8	104.8
65 years and over[3]	...	4,588.1	4,134.2	4,180.1	4,025.0	4,875.3	4,210.7
Diseases of the heart	390-398, 402, 404, 410-414, 420-429	592.4	496.3	612.2	564.6	578.4	448.5
Hypertension	400,401,403	404.1	384.5	300.1	272.5	477.2	462.9
Arthritis and rheumatism	710-718	306.6	249.2	183.6	186.6	393.3	293.0
Eye diseases, except refractive	360-369,371-379	263.0	341.1	187.9	311.2	315.9	362.0
Medical and surgical aftercare[5]	Y10	269.8	71.2	302.1	97.5	247.0	52.[illegible]
Diabetes mellitus	250	179.3	156.8	152.2	142.9	198.4	166.5

[1] Diagnostic groupings and code number inclusions are based on the *Eighth Revision International Classification of Diseases, Adapted for Use in the United States.*

[2] Age adjusted by direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

[3] Includes office visits to physicians for the most common and all other principal diagnoses.

[4] Upper respiratory infections.

[5] A change in coding procedures after 1976 is responsible for the drop in visits attributed to this diagnosis.

NOTE: Rates are based on the civilian noninstitutionalized population, excluding Alaska and Hawaii.

SOURCE: Division of Health Resources Utilization Statistics, National Center for Health Statistics: Data from the National Ambulatory Medical Care Survey.

Table 34. Office visits to physicians, according to physician specialty and selected patient characteristics: United States, 1973 and 1978

(Data are based on reporting by a sample of office-based physicians)

Characteristic	*All specialities*[1]		*General and family practice*		*Internal medicine*		*Obstetrics and gynecology*		*Pediatrics*		*General surgery*	
	1973	*1978*	*1973*	*1978*	*1973*	*1978*	*1973*	*1978*	*1973*	*1978*	*1973*	*1978*
	Visits per 1,000 population											
Total[2]	2,842.0	2,718.5	1,193.7	972.8	320.4	305.4	207.2	238.0	219.3	338.8	195.2	149.7
Age												
Under 15 years	1,976.0	2,160.1	739.5	646.4	31.7	19.6	11.6	12.1	714.3	1,106.5	68.3	47.2
15-44 years	2,710.9	2,496.8	1,137.8	921.9	244.9	210.3	433.6	485.0	24.7	41.3	181.8	134.4
45-64 years	3,498.7	3,276.7	1,538.4	1,244.7	571.4	598.7	116.9	154.2	8.3	8.1	322.4	243.9
65 years and over	4,588.1	4,134.2	2,054.5	1,584.7	967.7	935.8	32.4	53.6	9.2	1.8	359.4	319.4
Sex[2]												
Male	2,360.4	2,327.9	1,029.8	848.0	276.3	284.5	4.9	10.6	228.7	347.6	163.4	138.6
Female	3,280.0	3,081.5	1,341.9	1,087.2	359.0	323.9	396.3	452.2	209.5	329.6	223.0	159.8
Color[2]												
White	2,889.8	2,788.4	1,194.0	989.5	313.3	305.4	208.4	233.2	233.6	367.9	200.6	150.0
All other	2,542.6	2,306.3	1,219.5	877.4	365.3	298.9	196.4	266.6	141.0	197.0	151.3	144.6

Specialty

[1] Includes other specialties not shown separately.

[2] Age adjusted by the direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

NOTE: Rates are based on the civilian noninstitutionalized population, excluding Alaska and Hawaii.

SOURCE: Division of Health Resources Utilization Statistics, National Center for Health Statistics: Data from the National Ambulatory Medical Care Survey.

Table 35. Office visits to physicians, according to selected visit and patient characteristics: United States, 1973 and 1978

(Data are based on reporting by a sample of office-based physicians)

Patient characteristic	Visit characteristic					
	Patient's first visit		Visit lasted 10 minutes or less[1]		Return visit scheduled	
	1973	1978	1973	1978	1973	1978
	Percent of visits					
Total[2]	16.5	15.4	51.2	50.0	58.8	58.5
Age						
Under 15 years	17.2	14.4	61.0	60.8	47.8	48.7
15-44 years	20.5	19.4	49.4	49.3	59.6	59.4
45-64 years	11.8	12.0	44.0	41.4	65.2	64.5
65 years and over	7.6	8.4	44.8	39.1	74.0	70.8
Sex[2]						
Male	19.0	16.6	50.7	49.8	55.9	56.1
Female	15.3	14.7	51.6	50.1	60.0	59.7
Color[2]						
White	15.9	14.8	50.7	49.8	58.6	58.3
All other	21.2	19.7	55.2	51.8	60.1	59.7
Location of residence[2]						
Within SMSA	16.6	15.5	48.2	47.8	61.8	60.3
Outside SMSA	16.2	14.9	59.9	56.3	50.2	53.2

[1] Time spent in face-to-face contact between physician and patient.

[2] Age adjusted by the direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

NOTE: Rates are based on the civilian noninstitutionalized population, excluding Alaska and Hawaii.

SOURCE: Division of Health Resources Utilization Statistics, National Center for Health Statistics: Data from the National Ambulatory Medical Care Survey.

Table 36. Dental visits and interval since last visit, according to selected patient characteristics: United States, 1973 and 1978

(Data are based on household interviews of a sample of the civilian noninstitutionalized population)

Characteristic	*Visits per 1,000 population*		*Interval since last dental visit*								*Never visited dentist*	
			Less than 1 year		*1 year-less than 2 years*		*2-4 years*		*5 years or more*			
	1973	*1978*	*1973*	*1978*	*1973*	*1978*	*1973*	*1978*	*1973*	*1978*	*1973*	*1978*
			Percent of population									
Total[1,2,3]	1,617.1	1,605.9	48.8	49.9	10.9	13.1	13.7	12.3	13.7	12.8	11.8	10.5
Age												
Under 17 years	1,599.5	1,610.2	49.2	50.7	9.1	10.8	6.8	6.5	1.4	1.5	32.5	29.4
17-44 years	1,690.5	1,623.4	55.2	54.3	14.3	16.9	17.5	15.6	9.5	9.5	2.3	1.9
45-64 years	1,743.1	1,747.2	46.9	48.8	9.8	12.3	17.3	15.0	24.1	22.0	0.8	0.6
65 years and over	1,122.5	1,217.3	27.3	32.3	6.6	7.8	15.4	13.9	49.0	44.3	0.9	0.6
Sex[1]												
Male	1,430.5	1,446.9	46.7	48.1	11.2	13.3	14.5	12.8	14.2	13.4	12.2	10.8
Female	1,791.7	1,754.8	50.8	51.6	10.7	12.9	13.1	11.9	13.2	12.3	11.3	10.3
Race[1]												
White	1,721.4	1,688.8	51.2	52.3	10.8	12.6	13.1	11.6	13.2	12.4	10.7	9.8
Black	*874.9	*1,023.7	32.2	33.7	11.7	15.9	18.8	16.9	17.4	16.8	18.3	14.6
Family income[1,4]												
Less than $7,000	1,171.7	1,102.7	36.1	37.0	10.5	13.7	16.7	15.5	18.4	18.2	17.3	14.6
$7,000-$9,999	1,149.9	1,135.9	37.3	38.7	11.3	13.6	17.1	15.8	16.8	16.4	*16.8	*14.3
$10,000-$14,999	1,332.9	1,455.6	43.0	45.2	11.8	13.2	15.6	14.2	15.1	13.9	*13.8	*12.2
$15,000-$24,999	1,687.3	1,801.0	51.0	55.3	11.2	13.4	13.8	11.1	12.3	10.2	*10.8	*8.8
$25,000 or more	2,255.9	2,339.6	64.5	66.9	10.1	11.8	10.0	8.3	8.2	6.5	*6.3	*5.2
Geographic region[1]												
Northeast	1,956.5	1,865.9	53.9	55.0	10.7	12.4	12.0	10.8	12.5	11.9	10.0	*8.5
North Central	1,564.8	1,624.2	50.1	51.7	10.5	12.8	14.2	11.6	14.1	13.2	10.3	*9.5
South	1,245.5	1,313.6	43.3	43.9	11.2	13.1	14.7	14.0	15.1	14.6	14.5	12.9
West	1,922.8	1,775.2	50.2	51.5	11.6	14.3	13.9	12.2	12.0	10.1	11.3	*10.4
Location of residence[1]												
Within SMSA	1,758.1	1,722.0	50.9	51.8	11.0	13.3	13.4	11.7	12.5	11.5	11.1	10.2
Outside SMSA	1,309.5	1,353.1	44.3	45.6	10.7	12.6	14.7	13.6	16.2	15.7	13.1	11.3

[1] Age adjusted by the direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

[2] Includes all other races not shown separately.

[3] Includes unknown family income.

[4] Family income categories for 1978. Corresponding income categories in 1973, adjusting for inflation, were: less than $5,000; $5,000-$6,999; $7,000-$9,999; $10,000-$14,999; and $15,000 or more.

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

Table 37. Discharges from and days of care in short-stay hospitals, according to type of hospital and ownership: United States, 1973 and 1978

(Data are based on reporting by facilities)

Year and type of ownership	All short-stay hospitals	Community hospitals			All other hospitals			
		Total	General	Specialty	Total	General	Psychiatric	Other
					Number of discharges			
1973								
All ownerships	34,298,089	32,389,169	32,030,132	359,037	1,906,920	1,765,775	107,112	36,033
Government	8,745,316	6,946,394	6,900,269	46,125	1,798,922	1,750,742	36,997	11,183
Federal	1,688,462	-	-	-	1,688,462	1,683,948	-	4,514
State-local	7,056,854	6,946,394	6,900,269	46,125	110,460	66,794	36,997	6,669
Proprietary	2,547,421	2,493,483	2,431,039	62,444	53,938	-	38,438	15,500
Nonprofit	23,005,352	22,949,292	22,698,824	250,468	56,060	15,033	31,677	9,350
1978								
All ownerships	37,071,977	34,919,748	34,538,024	381,724	2,152,229	1,916,790	178,295	57,144
Government	9,282,057	7,275,423	7,229,794	45,629	2,006,634	1,903,195	80,105	23,334
Federal	1,865,293	-	-	-	1,865,293	1,855,431	-	9,862
State-local	7,416,764	7,275,423	7,229,794	45,629	141,341	47,764	80,105	13,472
Proprietary	3,104,611	3,027,897	2,955,512	72,385	76,714	-	54,653	22,061
Nonprofit	24,685,309	24,616,428	24,352,718	263,710	68,881	13,595	43,537	11,749
					Number of days of care			
1973								
All ownerships	282,833,407	253,565,874	250,876,556	2,689,318	29,267,533	26,582,222	2,183,371	501,940
Government	81,933,363	54,447,644	53,818,261	629,383	27,485,719	26,529,035	714,276	242,408
Federal	26,260,686	-	-	-	26,260,686	26,148,605	-	112,081
State-local	55,672,677	54,447,644	53,818,261	629,383	1,225,033	380,430	714,276	130,327
Proprietary	17,829,834	16,872,492	16,514,539	357,953	957,342	-	802,624	154,718
Nonprofit	183,070,210	182,245,738	180,543,756	1,701,982	824,472	53,187	666,471	104,814
1978								
All ownerships	294,904,239	263,752,360	260,438,255	3,314,105	31,151,879	24,625,376	5,512,407	1,014,096
Government	82,232,446	53,618,441	52,665,145	953,296	28,614,005	24,570,901	3,483,281	559,823
Federal	24,467,411	-	-	-	24,467,411	24,209,935	-	257,476
State-local	57,765,035	53,618,441	52,665,145	953,296	4,146,594	360,966	3,483,281	302,347
Proprietary	20,949,314	19,597,533	19,267,974	329,559	1,351,781	-	1,117,195	234,586
Nonprofit	191,722,479	190,536,386	188,505,136	2,031,250	1,186,093	54,475	911,931	219,687

NOTE: Community hospitals include all non-Federal short-stay hospitals classified by the American Hospital Association according to one of the following services: General medical and surgical; obstetrics and gynecology; eye, ear, nose, and throat; rehabilitation; orthopedic; other specialty; children's general; children's eye, ear, nose, and throat; children's rehabilitation; children's orthopedic; and children's other specialty.

SOURCE: Division of Health Manpower and Facilities Statistics, National Center for Health Statistics: Data from the National Master Facility Inventory.

Table 38. Discharges from and days of care in non-Federal short-stay hospitals, according to sex, age, selected first-listed diagnosis, and ICDA code: United States, 1973 and 1978

(Data are based on a sample of hospital records)

Sex, age, and first-listed diagnosis	ICDA code[1]	Discharges		Days of care	
		1973	1978	1973	1978
Both sexes[2,3]		*Number per 1,000 population*			
Total[4]	...	154.0	159.8	1,192.3	1,165.4
Diseases of the heart	390-398, 402, 404, 410-414, 420-429	11.3	12.9	130.2	125.3
Malignant neoplasms	140-209	6.6	7.9	90.4	98.1
Fracture	800-829	5.5	5.6	62.1	59.1
Neuroses and nonpsychotic disorders	300-309	4.4	5.6	43.5	53.2
Pneumonia	480-486	3.6	4.0	31.9	33.5
Male					
Under 15 years[4]	...	78.8	75.2	353.4	335.4
Pneumonia	480-486	5.3	5.6	36.1	32.0
Fracture	800-829	4.4	4.1	27.0	23.7
Congenital anomalies	740-759	3.7	3.6	23.6	21.2
Inguinal hernia	550, 552	3.2	2.7	8.6	6.2
Bronchitis, emphysema, asthma	490-493	2.9	3.0	13.2	11.7
Intercranial injury	850-854	2.3	2.7	6.6	8.9
15-44 years[4]	...	91.7	96.7	623.3	614.1
Fracture	300-829	6.8	7.2	56.1	57.1
Neuroses and nonpsychotic disorders	300-309	5.2	7.5	48.2	63.9
Lacerations	870-907	4.3	3.9	22.4	19.3
Sprains and strains	840-848	2.7	3.4	16.1	18.6
Diseases of the heart	390-398, 402, 404, 410-414, 420-429	3.0	2.8	27.8	20.4
Intercranial injury	850-854	2.4	2.6	13.4	14.0
45-64 years[4]	...	179.1	191.9	1,662.3	1,619.4
Diseases of the heart	390-398, 402, 404, 410-414, 420-429	28.0	33.2	300.3	297.9
Malignant neoplasms	140-209	11.9	13.8	160.2	171.5
Neuroses and nonpsychotic disorders	300-309	8.0	10.7	70.6	96.6
Inguinal hernia	550, 552	7.7	6.8	54.6	37.1
Fracture	800-829	5.2	5.0	56.2	53.7
Ulcer	531-534	4.8	3.5	46.7	32.3
65 years and over[4]	...	367.0	412.1	4,247.1	4,330.4
Diseases of the heart	390-398, 402, 404, 410-414, 420-429	70.0	78.7	822.6	809.5
Malignant neoplasms	140-209	40.1	49.6	604.0	641.7
Cerebrovascular disease	430-438	22.6	20.8	295.4	275.9
Hyperplasia of prostate	600	18.5	19.4	229.8	195.1
Pneumonia	480-486	13.2	16.8	155.4	187.8

See footnotes at end of table.

Table 38. Discharges from and days of care in non-Federal short-stay hospitals, according to sex, age, selected first-listed diagnosis, and ICDA code: United States, 1973 and 1978—Continued

(Data are based on a sample of hospital records)

Sex, age, and first-listed diagnosis	ICDA code[1]	Discharges		Days of care	
		1973	1978	1973	1978
Female		Number per 1,000 population			
Under 15 years[4]	...	62.4	62.1	288.5	272.9
Pneumonia	480-486	4.0	4.1	24.7	21.2
Fracture	800-829	2.5	2.5	15.2	14.4
Congenital anomalies	740-759	2.2	2.5	15.1	15.1
Bronchitis, emphysema, asthma	490-493	1.8	2.0	8.6	8.0
Eye diseases and conditions	360-379	1.4	1.4	5.4	3.2
15-44 years[4]	...	212.9	210.5	1,116.1	1,024.4
Delivery	650-662	68.2	67.2	273.6	252.9
Disorders of menstruation	626	8.2	8.4	33.6	29.7
Benign neoplasms	210-228	7.0	6.3	42.7	33.2
Neuroses and nonpsychotic disorders	300-309	6.3	6.9	60.4	61.9
Malignant neoplasms	140-209	3.0	3.1	26.0	28.3
Cholelithiasis (gallstones)	574	3.0	2.8	26.0	22.2
45-64 years[4]	...	185.0	194.2	1,658.0	1,656.4
Diseases of the heart	390-398, 402, 404, 410-414, 420-429	13.8	16.8	144.6	149.9
Malignant neoplasms	140-209	13.2	16.4	172.4	201.8
Benign neoplasms	210-228	9.3	7.1	64.8	43.3
Disorders of menstruation	626	7.2	7.2	30.6	25.4
Neuroses and nonpsychotic disorders	300-309	5.4	6.5	56.6	71.6
65 years and over[4]	...	323.5	360.7	4,051.7	4,081.2
Diseases of the heart	390-398, 402, 404, 410-414, 420-429	56.8	64.3	745.3	706.3
Malignant neoplasms	140-209	25.4	29.6	400.0	416.0
Fracture	800-829	21.8	22.6	388.2	378.7
Cerebrovascular disease	430-438	20.4	20.1	293.2	285.4
Eye diseases and conditions	360-379	12.4	16.0	85.8	73.4
Arthritis and rheumatism	710-718	9.6	10.9	132.8	146.8

[1] Diagnostic groupings and code number inclusions are based on the *Eighth Revision International Classification of Diseases, Adapted for Use in the United States.*

[2] Age adjusted by the direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

[3] Includes data for which sex was not stated.

[4] Includes all diagnoses.

NOTE: Rates are based on the civilian noninstitutionalized population.

SOURCE: Division of Health Resources Utilization Statistics, National Center for Health Statistics: Data from the National Hospital Discharge Survey.

Table 39. Discharges from and days of care in non-Federal short-stay hospitals for all patients and for patients with surgery, according to bed size of hospital and age of patient: United States, 1973 and 1978

(Data are based on a sample of hospital records)

Bed size of hospital and age of patient	*Discharges*				*Days of care*			
	All patients		*Patients with surgery*		*All patients*		*Patients with surgery*	
	1973	*1978*	*1973*	*1978*	*1973*	*1978*	*1973*	*1978*
All sizes	*Number per 1,000 population*							
All ages[1,2]	154.0	159.8	63.7	65.9	1,192.3	1,165.4	504.0	500.4
Under 15 years	70.8	68.8	33.5	28.7	321.9	304.8	134.3	120.5
15-44 years	154.4	155.1	69.1	71.5	878.5	824.7	414.0	390.5
45-64 years	182.3	193.1	77.1	81.0	1,661.0	1,638.7	751.3	742.4
65 years and over	341.8	381.9	102.4	121.6	4,136.4	4,183.8	1,465.8	1,589.1
6-99 beds								
All ages[1,2]	31.6	30.8	9.2	8.2	203.2	186.1	56.6	48.3
Under 15 years	14.3	12.5	5.7	3.9	52.4	43.9	17.4	11.4
15-44 years	28.8	28.2	10.2	9.5	126.4	128.4	49.8	43.7
45-64 years	36.0	36.1	10.2	8.9	246.9	238.6	73.2	61.7
65 years and over	86.7	85.6	13.6	13.9	889.6	747.2	167.8	150.2
100-199 beds								
All ages[1,2]	26.3	27.1	10.1	10.5	189.8	179.9	70.7	68.9
Under 15 years	12.4	11.5	5.3	4.1	50.6	44.8	17.8	14.0
15-44 years	27.1	26.4	11.9	12.4	138.6	124.0	63.1	57.7
45-64 years	28.5	31.7	10.7	12.0	239.7	240.8	91.8	93.7
65 years and over	60.1	67.0	15.6	18.8	718.9	693.1	216.9	228.5
200-299 beds								
All ages[1,2]	27.0	28.4	11.8	12.6	206.3	204.4	93.1	92.4
Under 15 years	13.4	12.7	6.8	5.8	56.7	53.4	24.3	21.6
15-44 years	27.1	28.0	12.3	13.8	155.3	142.3	75.8	71.1
45-64 years	30.9	32.5	14.2	14.6	284.0	270.6	136.8	127.6
65 years and over	58.7	68.3	19.9	24.1	705.8	780.3	279.7	320.2

See footnotes at end of table.

Table 39. Discharges from and days of care in non-Federal short-stay hospitals for all patients and for patients with surgery, according to bed size of hospital and age of patient: United States, 1973 and 1978—Continued

(Data are based on a sample of hospital records)

Bed size of hospital and age of patient	Discharges				Days of care			
	All patients		Patients with surgery		All patients		Patients with surgery	
	1973	1978	1973	1978	1973	1978	1973	1978
300-499 beds	Number per 1,000 population							
All ages[1,2]	39.4	37.1	18.4	16.7	331.2	289.6	151.5	134.4
Under 15 years	18.0	16.4	9.5	7.2	83.7	72.9	38.4	28.7
15-44 years	39.5	35.6	19.2	17.1	243.8	203.4	116.9	100.0
45-64 years	49.3	46.7	23.6	22.0	492.7	426.9	238.1	208.6
65 years and over	82.6	85.4	30.9	32.6	1,099.6	1,012.3	452.3	439.0
500 beds or more								
All ages[1,2]	29.6	36.4	14.1	17.8	261.9	305.3	132.1	156.4
Under 15 years	12.7	15.7	6.2	7.7	78.5	89.8	36.4	44.8
15-44 years	31.9	36.9	15.6	18.8	214.4	226.6	108.4	118.0
45-64 years	37.6	46.0	18.4	23.5	397.7	461.8	211.4	250.8
65 years and over	53.8	75.6	22.5	32.2	722.4	950.8	349.1	451.1

[1] Includes age not stated.

[2] Age adjusted by the direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

NOTES: Excludes newborn infants. Rates are based on the civilian noninstitutionalized population.

SOURCE: Division of Health Resources Utilization Statistics, National Center for Health Statistics: Data from the National Hospital Discharge Survey.

Table 40. Discharges from and days of care in short-stay hospitals, according to selected characteristics: United States, 1973 and 1978

(Data are based on household interviews of a sample of the civilian noninstitutionalized population)

Characteristic	*Discharges*[1]		*Days of care*[1]	
	1973	*1978*	*1973*	*1978*
	Number per 1,000 population			
Total[2,3,4]	123.9	122.6	1,056.7	1,009.1
Age				
Under 17 years	68.6	67.0	395.8	346.3
17-44 years	119.7	104.3	809.6	690.0
45-64 years	166.1	176.0	1,688.9	1,614.8
65 years and over	237.8	267.7	2,899.7	3,192.6
Sex[2]				
Male	118.4	121.0	1,091.8	1,117.5
Female	129.0	124.8	1,028.0	927.6
Race[2]				
White	124.3	122.2	1,029.5	963.5
Black	120.6	130.6	1,287.2	1,480.0
Family income[2,5]				
Less than $7,000	155.9	149.7	1,473.5	1,422.6
$7,000-$9,999	134.1	144.9	1,346.3	1,292.9
$10,000-$14,999	128.4	120.9	1,050.3	924.2
$15,000-$24,999	116.2	116.1	934.7	880.2
$25,000 or more	110.2	102.6	838.6	719.9
Geographic area[2]				
Northeast	107.9	105.4	1,029.0	962.6
North Central	130.0	132.0	1,085.9	1,068.4
South	133.8	135.8	1,148.6	1,088.4
West	118.9	107.2	875.4	844.5
Location of residence[2]				
Within SMSA	116.7	117.0	1,036.8	1,016.0
Outside SMSA	139.8	134.6	1,101.6	992.2

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[1] Excluding deliveries.

[2] Age adjusted by the direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

[3] Includes all other races not shown separately.

[4] Includes unknown family income.

[5] Family income categories for 1978. Corresponding income categories in 1973, adjusting for inflation, were: less than $5,000; $5,000-$6,999; $7,000-$9,999; $10,000-$14,999; and $15,000 or more.

SOURCE: Division of Health Interview Statistics, National Center for Health Statistics: Data from the National Health Interview Survey.

Table 41. Operations for inpatients discharged from non-Federal short-stay hospitals, according to sex, age, leading surgical category, and ICDA code: United States, 1973 and 1978

(Data are based on a sample of hospital records)

Sex, age, and leading surgical category	*ICDA code*[1]	*Operations*			
		1973	*1978*	*1973*	*1978*
Both sexes[2]		*Number in thousands*		*Number per 1,000 population*	
Total[3]	...	18,426	20,754	88.4	93.1
Biopsy	A1-A2	919	1,172	4.4	5.2
Dilation and curettage of uterus	70.3-74.7	1,019	1,052	4.9	4.6
Hysterectomy	69.1-69.5	690	644	3.2	2.8
Tonsillectomy with or without adenoidectomy	21.1-21.2	884	548	4.5	2.9
Repair of inguinal hernia	38.2-38.3	525	510	2.5	2.4
Male					
Under 15 years[3]	...	1,337	1,094	47.2	42.3
Tonsillectomy, with or without adenoidectomy	21.1-21.2	317	175	11.2	6.8
Myringotomy	17.0	116	121	4.1	4.7
Repair of inguinal hernia	38.2-38.3	101	77	3.6	3.0
Closed reduction of fracture without fixation	[4]82.0	67	53	2.4	2.1
Appendectomy[5]	41.1	59	44	2.1	1.7
15-44 years[3]	...	2,347	2,728	55.6	57.8
Repair of inguinal hernia	38.2-38.3	112	119	2.6	2.5
Excision of semilunar cartilage of knee joint	86.5	64	94	1.5	2.0
Appendectomy[5]	41.1	94	88	2.2	1.9
Suture of skin or mucous membrane	92.5	86	82	2.0	1.7
Biopsy	A1-A2	63	78	1.5	1.6
45-64 years[3]	...	1,904	2,154	93.8	103.8
Repair of inguinal hernia	38.2-38.3	160	145	7.9	7.0
Biopsy	A1-A2	115	169	5.7	8.1
Cardiac catheterization	30.2	60	117	3.0	5.7
Prostatectomy	58.1-58.3	71	68	3.5	3.3
Excision of lesion of skin and subcutaneous tissue	92.1-92.2	65	63	3.2	3.0
65 years and over[3]	...	1,348	1,854	159.9	197.1
Prostatectomy	58.1-58.3	175	226	20.8	24.0
Biopsy	A1-A2	106	179	12.5	19.0
Repair of inguinal hernia	38.2-38.3	90	107	10.7	11.4
Extraction of lens	[4]14.4-14.6	71	91	8.4	9.7
Local excision and destruction of lesion of bladder	56.1-56.2	43	59	5.1	6.2

See footnotes at end of table.

Table 41. Operations for inpatients discharged from non-Federal short-stay hospitals, according to sex, age, leading surgical category, and ICDA code: United States, 1973 and 1978—Continued

(Data are based on a sample of hospital records)

Sex, age, and leading surgical category	ICDA code[1]	Operations			
		1973	1978	1973	1978
Female		Number in thousands		Number per 1,000 population	
Under 15 years[3]	...	988	813	36.3	32.7
Tonsillectomy, with or without adenoidectomy	21.1-21.2	330	185	12.1	7.4
Myringotomy	17.0	82	87	3.0	3.5
Appendectomy[5]	41.1	44	38	1.6	1.5
Dilation of urethra	57.5	50	25	1.8	1.0
Closed reduction of fracture without fixation	[4]82.0	36	32	1.3	1.3
Adenoidectomy without tonsillectomy	21.3	26	35	0.9	1.4
15-44 years[3]	...	6,069	7,025	134.6	141.2
Dilation and curettage of uterus	70.3, 74.7	678	745	15.0	15.0
Hysterectomy	69.1-69.5	415	406	9.2	8.2
Cesarean section	77.0-77.9	244	508	5.4	10.2
Ligation and division of fallopian tubes, bilateral	68.5	295	542	6.5	10.9
Biopsy	A1-A2	259	274	5.7	5.5
Oophorectomy, salpingo-oophorectomy	67.2-67.5	239	257	5.3	5.2
45-64 years[3]	...	2,920	3,012	130.7	132.9
Biopsy	A1-A2	222	255	10.0	11.3
Dilation and curettage of uterus	70.3, 74.7	297	257	13.3	11.3
Hysterectomy	69.1-69.5	243	197	10.9	8.7
Oophorectomy, salpingo-oophorectomy	67.2-67.5	165	148	7.4	6.5
Cholecystectomy	43.5	114	113	5.1	5.0
65 years and over[3]	...	1,504	2,072	126.8	154.7
Biopsy	A1-A2	122	182	10.3	13.5
Extraction of lens	[4]14.4-14.6	117	174	9.9	13.0
Reduction of fracture with fixation	[4]82.2	49	47	4.1	3.5
Cholecystectomy	43.5	66	71	5.6	5.3
Excision of lesion of skin and subcutaneous tissue	92.1-92.2	38	57	3.2	4.2
Dilation and curettage of uterus	70.3, 74.7	40	44	3.4	3.3

[1] Surgical groupings and code number inclusions are based on the *Eighth Revision International Classification of Diseases, Adapted for Use in the United States.*

[2] Age adjusted by the direct method to the 1970 civilian noninstitutionalized population, using 4 age intervals.

[3] Includes operations not listed in table.

[4] These codes are modifications of ICDA codes for use in the National Hospital Discharge Survey.

[5] Limited to estimated number of appendectomies, excluding those performed incidental to other abdominal surgery.

NOTE: Excludes newborn infants. Rates are based on the civilian noninstitutionalized population.

SOURCE: Division of Health Resources Utilization Statistics, National Center for Health Statistics: Data from the National Hospital Discharge Survey.

Table 42. Nursing home residents, according to selected functional status and age: United States, 1973-74 and 1977

(Data are based on a sample of nursing homes)

Functional status	1973-74[1]					1977				
	All ages	*Under 65 years*	*65-74 years*	*75-84 years*	*85 years and over*	*All ages*	*Under 65 years*	*65-74 years*	*75-84 years*	*85 years and over*
	Number of residents									
All residents	1,075,800	114,300	163,100	384,900	413,600	1,303,100	177,100	211,400	464,700	449,900
	Percent distribution									
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Dressing										
Independent	23.3	34.8	34.4	30.2	25.0	30.6	44.8	38.8	27.5	24.2
Requires assistance, includes those who do not dress	70.8	65.2	65.6	69.9	75.1	69.4	55.2	61.2	72.5	75.8
Using toilet room										
Independent	47.5	56.4	53.6	48.0	42.2	47.5	61.8	53.1	45.7	41.0
Requires assistance	30.8	21.6	27.3	31.5	34.1	42.5	28.1	37.8	44.7	48.0
Does not use toilet room	21.7	22.0	19.1	20.5	23.7	10.1	10.1	9.1	9.6	11.0
Mobility										
Walks independently	48.6	58.2	55.4	49.6	42.2	33.9	53.6	43.2	33.2	22.5
Walks with assistance	20.2	11.1	15.5	20.4	24.4	28.8	15.7	21.4	30.5	35.6
Chairfast	26.5	24.8	24.9	25.9	28.2	32.0	25.5	30.5	31.5	35.9
Bedfast	4.7	5.9	4.1	4.1	5.2	5.3	5.2	5.0	4.9	6.1
Continence										
No difficulty controlling bowel or bladder	66.2	72.6	70.9	66.8	61.9	54.7	68.0	62.4	52.9	47.8
Difficulty controlling bowel	1.1	*0.8	*1.2	1.1	1.2	3.7	3.0	3.7	4.0	3.8
Difficulty controlling bladder	4.2	2.4	4.4	4.2	4.7	9.0	5.8	6.5	9.4	11.1
Difficulty controlling both bowels and bladder	28.1	23.4	23.0	27.5	31.9	25.9	16.8	20.6	26.9	30.8
Ostomy in either bowel or bladder	0.4	*0.8	*0.4	*0.4	*0.3	6.7	6.4	6.8	6.9	6.5

See footnotes at end of table.

Table 42. Nursing home residents, according to selected functional status and age: United States, 1973-74 and 1977—Continued

(Data are based on a sample of nursing homes)

Functional status	1973-74[1]					1977				
	All ages	*Under 65 years*	*65-74 years*	*75-84 years*	*85 years and over*	*All ages*	*Under 65 years*	*65-74 years*	*75-84 years*	*85 years and over*
Eating	*Percent distribution*									
Independent	65.2	67.0	68.1	66.0	62.8	67.4	73.8	72.9	66.2	63.5
Requires assistance, includes those who are tube or intravenously fed	34.8	33.0	31.9	34.0	37.2	32.6	26.2	27.1	33.8	36.5
Vision										
Not impaired	53.5	70.6	62.3	53.8	45.0	67.2	81.0	75.4	67.9	57.2
Partially impaired	33.7	21.7	28.8	35.0	37.6	19.0	11.0	13.4	19.6	24.1
Severely impaired	10.0	5.0	6.3	8.9	14.0	6.6	2.2	3.3	6.1	10.4
Completely lost	2.8	2.7	2.6	2.3	3.5	3.0	2.2	2.6	2.6	3.8
Unknown	...	...	...	...	...	4.3	3.8	5.3	3.9	4.5
Hearing										
Not impaired	67.8	88.4	80.3	70.0	55.2	69.5	87.6	81.0	71.6	54.9
Partially impaired	26.1	9.2	17.0	25.5	34.8	21.7	6.6	11.4	21.2	33.1
Severely impaired	5.1	1.6	1.9	3.8	8.7	4.3	*0.4	1.9	3.0	8.4
Completely lost	1.0	*0.8	*0.8	0.7	1.4	0.7	*1.1	*0.7	*0.6	*0.7
Unknown	...	...	...	...	...	3.7	4.4	5.0	3.6	3.0

[1] Excludes residents in personal care or domiciliary care homes.

SOURCE: Division of Health Resources Utilization Statistics, National Center for Health Statistics: Unpublished data from the National Nursing Home Survey.

Table 43. Nursing home and personal care home residents 65 years of age and over and number per 1,000 population, according to sex and color: United States, 1963, 1969, 1973-74, and 1977

(Data are based on a sample of nursing homes)

Year and age	Total	Sex		Color		Total	Sex		Color	
		Male	Female	White[1]	All other		Male	Female	White[1]	All other
1963	Number of residents					Number per 1,000 population				
65 years and over	445,600	141,000	304,500	431,700	13,800	25.4	18.1	31.1	26.6	10.3
65-74 years	89,600	35,100	54,500	84,400	5,200	7.9	6.8	8.8	8.1	5.9
75-84 years	207,200	65,200	142,000	202,000	5,300	39.6	29.1	47.5	41.7	13.8
85 years and over	148,700	40,700	108,000	145,400	3,300	148.4	105.6	175.1	157.7	41.8
1969										
65 years and over	722,200	207,100	515,200	695,000	27,300	37.1	25.0	46.1	38.8	17.6
65-74 years	138,500	52,200	86,300	129,500	9,000	11.6	9.9	12.9	11.7	9.6
75-84 years	321,800	90,800	231,100	310,900	10,900	51.7	36.0	62.3	54.1	22.9
85 years and over	261,900	64,100	197,800	254,500	7,400	203.2	130.8	247.6	221.9	52.4
1973-74[2]										
65 years and over	961,500	265,700	695,800	920,600	40,900	45.1	30.2	55.5	47.3	21.9
65-74 years	163,100	65,100	98,100	150,100	13,000	12.3	11.3	13.1	12.5	10.6
75-84 years	384,900	102,300	282,600	369,700	15,200	59.4	40.8	71.1	61.9	30.1
85 years and over	413,600	98,300	315,300	400,800	12,800	253.7	180.4	290.6	269.0	91.4
1977[3]										
65 years and over	1,126,000	294,000	832,000	1,059,900	66,100	47.9	30.7	59.7	49.7	30.4
65-74 years	211,400	80,200	131,200	187,500	23,800	14.5	12.7	15.9	14.2	16.8
75-84 years	464,700	122,100	342,600	443,200	21,500	68.0	47.4	80.6	70.6	38.6
85 years and over	449,900	91,700	358,200	429,100	20,800	216.4	140.0	251.5	229.0	102.0

[1] Includes Hispanics.

[2] Excludes residents in personal care homes.

[3] Includes residents in domiciliary care homes.

SOURCES: National Center for Health Statistics: Characteristics of residents in institutions for the aged and chronically ill, United States, April-June 1963, by G.S. Wunderlich. *Vital and Health Statistics.* Series 12-No. 2. DHEW Pub. No. (PHS) 1000. Public Health Service. Washington. U.S. Government Printing Office, Sept. 1965; Measures of chronic illness among residents of nursing and personal care homes, United States, by D.K. Ingram. *Vital and Health Statistics.* Series 12-No. 24. DHEW Pub. No. (HRA) 74-1709. Health Resources Administration. Washington. U.S. Government Printing Office, Mar. 1974; Unpublished data from the National Nursing Home Survey.

Table 44. Additions to mental health facilities and percent change, according to service mode and type of facility: United States, 1971 and 1977

(Data are based on reporting by facilities)

Type of facility	Service mode								
	Inpatient			*Outpatient*			*Day treatment*		
	1971	*1977*[1]	*Percent change 1971-77*	*1971*	*1977*[1]	*Percent change 1971-77*	*1971*	*1977*[1]	*Percent change 1971-77*
	Number of additions			*Number of additions*			*Number of additions*		
All facilities	1,269,029	1,588,964	25.2	1,378,822	2,386,982	73.1	75,545	171,118	126.5
Non-Federal psychiatric hospitals	494,640	552,854	11.8	147,383	146,797	-0.4	18,448	14,530	-21.2
State and county hospitals	407,640	414,703	1.7	129,133	107,127	-17.0	16,554	10,631	-35.8
Private hospitals	87,000	138,151	58.8	18,250	39,670	117.4	1,894	3,899	105.9
Veterans Administration hospitals[2]	134,065	183,461	36.8	51,645	123,893	139.9	4,023	6,978	73.5
Non-Federal general hospital psychiatric units	519,926	552,437	6.3	282,677	225,765	-20.1	11,563	13,260	14.7
Government hospital psychiatric units	215,158	135,460	-37.0	139,077	99,543	-28.4	4,291	3,480	-18.9
Private hospital psychiatric units	304,768	416,977	36.8	143,600	126,222	-12.1	7,272	9,780	34.5
Residential treatment centers for emotionally disturbed children	11,148	15,152	35.9	10,156	18,155	78.8	994	3,147	216.6
Federally-funded community mental health centers	75,900	257,347	239.1	335,648	876,121	161.0	21,092	102,493	385.9
Freestanding outpatient clinics	-	-	-	484,677	889,589	83.5	10,642	21,149	98.7
Government	-	-	-	273,358	340,953	24.7	7,737	8,059	4.2
Private	-	-	-	211,319	548,636	159.6	2,905	13,090	350.6
Other mental health facilities	33,350	27,713	-16.9	66,636	106,662	60.1	8,783	9,561	8.9

[1] Provisional estimates.

[2] Includes Veterans Administration neuropsychiatric hospitals and Veterans Administration general hospitals with separate psychiatric modalities.

SOURCE: National Institute of Mental Health: Unpublished data from the Division of Biometry and Epidemiology.

Table 45. Persons employed in the health service industry, according to place of employment: United States, 1970-79

(Data are based on household interviews of a sample of the civilian noninstitutionalized population)

Place of employment	*Year*					
	1970[1]	*1975*	*1976*	*1977*	*1978*	*1979*
	Number of persons in thousands					
Total	4,246	5,865	6,122	6,328	6,673	6,849
Offices of physicians	477	607	641	677	753	755
Offices of dentists	222	327	325	321	360	385
Offices of chiropractors	19	30	27	29	—	—
Hospitals	2,690	3,394	3,568	3,645	3,781	3,843
Convalescent institutions	509	884	945	949	1,009	1,035
Offices of other health practitioners	42	60	68	75	83	84
Other health service sites	288	563	548	632	687	747

[1] April 1, derived from decennial census; all other data years are July 1 estimates.

NOTE: Totals exclude persons in health-related occupations who are working in nonhealth industries, as classified by the U.S. Bureau of the Census, such as pharmacists employed in drug-stores, school nurses, and nurses working in private households.

SOURCES: U.S. Bureau of the Census: 1970 Census of Population, occupation by industry. *Subject Reports.* Final Report PC(2)-7C. Washington. U.S. Government Printing Office, Oct. 1972, p. 473; U.S. Bureau of Labor Statistics: *Employment and Earnings, March 1977, January 1978, January 1979,* and *January 1980.* Vol. 24, No. 3, Vol. 25, No. 1, Vol. 26, No. 1, and Vol. 27, No. 1. Washington. U.S. Government Printing Office, Mar. 1977, Jan. 1978, Jan. 1979, and Jan. 1980, and unpublished data.

Table 48. Persons 16 years of age and over employed in selected health-related occupations: United States, selected years 1970-79

(Data are based on household interviews of a sample of the civilian noninstitutionalized population)

Occupation	Year					
	1970[1]	*1975*	*1976*	*1977*	*1978*	*1979*
	Number of persons in thousands					
Total, 16 years and over	3,103	4,169	4,341	4,517	4,753	4,951
Physicians, medical and osteopathic	281	354	368	403	424	431
Dentists	91	110	107	105	117	131
Pharmacists	110	119	123	138	136	135
Registered nurses	830	935	999	1,063	1,112	1,223
Therapists	75	157	159	178	189	207
Health technologists and technicians	260	397	436	462	498	534
Health administrators	84	152	162	175	184	185
Dental assistants	88	126	122	123	130	134
Health aides, excluding nursing	119	211	229	234	270	281
Nursing aides, orderlies, and attendants	718	1,001	1,002	1,008	1,037	1,024
Practical nurses	237	370	381	371	402	376
Other health-related occupations[2]	210	237	253	257	254	290

[1] Based on the 1970 decennial census; all other years are annual averages derived from the Current Population Survey.

[2] Includes chiropractors, optometrists, podiatrists, veterinarians, dietitians, embalmers, funeral directors, opticians, lens grinders and polishers, dental lab technicians, lay midwives, and health trainees.

NOTE: Data were compiled by the U.S. Bureau of the Census from the Current Population Survey. These data differ from those published by the National Center for Health Statistics in various editions of *Health Resources Statistics*, because the latter are derived from a variety of sources.

SOURCES: U.S. Bureau of the Census: *Census of Population, 1970, Detailed Characteristics.* Final Report PC1-(D). Washington. U.S. Government Printing Office, Feb. 1973; U.S. Bureau of Labor Statistics: *Employment and Earnings, January 1978, January 1979,* and *January 1980.* Vol. 25, No. 1, Vol. 26, No. 1, and Vol. 27, No. 1. Washington. U.S. Government Printing Office, Jan. 1978, Jan. 1979, and Jan. 1980, and unpublished data.

Table 47. Professionally active physicians (M.D.'s and D.O.'s), according to type of physician, and number per 10,000 population: United States and outlying U.S. areas, selected 1950-79 estimates and 1980, 1985, and 1990 projections

(Data are based on reporting by physicians and medical schools)

Year	Type of physician			Professionally active nhysicians per 10,000 population
	Total	Doctors of medicine (M.D.)	Doctors of osteopathy (D.O.)	
	Number of physicians			
1950	219,900	209,000	10,900	14.2
1960	259,500	247,300	12,200	14.2
1970	323,200	311,200	12,300	15.5
1971	334,100	322,000	12,100	15.9
1972	345,000	332,400	12,600	16.3
1973	350,100	337,000	13,100	16.4
1974	362,500	348,900	13,600	16.8
1975	378,600	364,500	14,100	17.4
1976	390,600	376,100	14,700	17.9
1977	395,200	380,200	15,400	17.9
1978	419,520	403,420	16,100	18.8
1979	433,600	416,700	16,900	19.3
1980	444,000	429,800	17,700	19.7
1985	519,000	500,570	23,200	21.9
1990	594,000	568,500	29,900	23.9

NOTES: The population for selected years 1950-79 includes residents in the 50 States, District of Columbia, and civilians in Puerto Rico and other U.S. outlying areas; U.S. citizens in foreign countries; and the Armed Forces in the United States and abroad. For 1980, 1985, and 1990, the Series II projections of the total population from the U.S. Bureau of the Census are used. Estimation and projection methods used are from the Bureau of Health Professions. The numbers of M.D.'s differ from American Medical Association figures because a variant proportion of the physicians not classified by specialty is allocated into the totals.

SOURCES: Bureau of Health Manpower: *A Report to the President and Congress on the Status of Health Professions Personnel in the United States*. DHEW Pub. No. (HRA) 78-93. Health Resources Administration. Hyattsville, Md., Aug. 1978; Division of Manpower Analysis, Bureau of Health Professions, *Supply of Manpower in Selected Health Occupations, 1950-1990*. HRA Pub. No. 80-35. Health Resources Administration. Hyattsville, Md., Jan. 1980, and selected data from Manpower Analysis Branch; U.S. Bureau of the Census: *Current Population Reports*. Series P-25, Nos. 336, 603, 704, 731, and 803. Washington. U.S. Government Printing Office, Apr. 1966, July 1975, July 1977, Sept. 1978, and June 1979, and unpublished data.

Table 48. Physicians (M.D.'s), according to activity: United States, selected years 1970-78

(Data are based on reporting by physicians)

Activity	1970	1975	1976	1977	1978
	Number of physicians				
Doctors of medicine	328,020	388,626	404,338	416,645	432,434
Professionally active physicians	304,926	335,608	343,876	359,515	371,343
Non-Federal	278,855	309,410	318,089	340,603	352,390
Patient care	252,778	285,345	292,152	312,872	322,835
Office-based practice	187,637	211,776	213,117	229,208	237,071
General practice[1]	50,415	45,863	45,503	44,548	44,649
Other specialty	137,222	165,913	167,614	184,660	192,422
Hospital-based practice	65,141	73,569	79,035	83,664	85,764
Residents[2]	45,514	53,150	58,482	58,517	56,866
Full-time hospital staff	19,627	20,419	20,553	25,147	28,898
Other professional activity[3]	26,077	24,065	25,937	27,731	29,555
Federal	26,071	26,198	25,787	18,912	18,953
Patient care	20,566	22,325	22,086	15,774	15,777
Office-based practice	2,819	1,841	1,652	902	865
General practice[1]	906	557	519	238	231
Other specialty	1,913	1,284	1,133	664	634
Hospital-based practice	17,747	20,484	20,434	14,872	14,912
Residents[2]	5,173	4,089	3,934	3,527	3,297
Full-time hospital staff	12,574	16,395	16,500	11,345	11,615
Other professional activity[3]	5,505	3,873	3,701	3,138	3,176
Inactive physicians	19,533	21,360	22,024	28,231	26,698
Not classified[4]	357	25,790	29,681	17,953	25,102
Unknown[5]	3,204	5,868	8,757	10,946	9,291

[1] Includes general practice and family practice.

[2] Includes interns and residents, all years.

[3] Includes medical teaching, administration, research, and other.

[4] Information not available.

[5] Physicians with unknown address.

NOTE: Federal and non-Federal doctors of medicine (M.D.'s) in the 50 States and the District of Columbia are included.

SOURCES: Haug, J.N., Roback, G.A., and Martin, B.C.: *Distribution of Physicians in the United States, 1970.* Chicago. American Medical Association, 1971. (Copyright 1971: Used with the permission of the American Medical Association.); Goodman, L.J., and Mason, H.R.: *Physician Distribution and Medical Licensure in the U.S., 1975.* Chicago. American Medical Association, 1976. (Copyright 1976: Used with the permission of the American Medical Association.); Goodman, L.J.: *Physician Distribution and Medical Licensure in the U.S., 1976.* Chicago. American Medical Association, 1977. (Copyright 1977: Used with the permission of the American Medical Association.); Department of Statistical Analysis: *Physician Distribution and Medical Licensure in the U.S., 1977.* Chicago. American Medical Association, 1979. (Copyright 1979: Used with the permission of the American Medical Association.); Department of Statistical Analysis: *Physician Distribution and Medical Licensure in the U.S., 1978.* Chicago. American Medical Association, 1980. (Copyright 1980: Used with the permission of the American Medical Association.)

Table 49. Professionally active physicians (M.D.'s), according to primary specialty: United States, selected years 1970-78

(Data are based on reporting by physicians)

Primary specialty	Year				
	1970	*1975*	*1976*	*1977*	*1978*
	Number of physicians				
Professionally active physicians	304,926	335,608	343,876	359,515	371,343
Primary care	115,505	128,745	134,051	139,248	141,610
General practice[1]	56,804	53,714	54,631	54,361	55,414
Internal medicine	41,196	53,712	57,312	61,278	62,056
Pediatrics	17,505	21,319	22,108	23,609	24,140
Other medical specialties	17,127	18,743	18,702	19,656	22,277
Dermatology	3,937	4,594	4,755	4,844	5,032
Pediatric allergy	388	439	469	485	431
Pediatric cardiology	471	527	537	563	575
Internal medicine subspecialties[2]	12,331	13,183	12,941	13,764	16,239
Surgical specialties	84,545	94,776	97,416	100,059	101,216
General surgery	29,216	31,173	31,899	32,014	31,699
Neurological surgery	2,537	2,898	2,959	3,049	3,071
Obstetrics and gynecology	18,498	21,330	21,908	23,038	23,591
Ophthalmology	9,793	11,011	11,326	11,483	11,798
Orthopedic surgery	9,467	11,267	11,689	12,223	12,553
Otolaryngology	5,305	5,670	5,788	5,910	6,040
Plastic surgery	1,583	2,224	2,337	2,509	2,610
Colon and rectal surgery	663	655	667	652	673
Thoracic surgery	1,779	1,960	2,020	2,131	2,025
Urology	5,704	6,588	6,823	7,050	7,156
Other specialties	87,749	93,344	93,707	100,552	106,240
Anesthesiology	10,725	12,741	13,074	13,815	14,137
Neurology	3,027	4,085	4,374	4,577	4,873
Pathology	10,135	11,603	11,815	12,260	12,517
Forensic pathology	193	186	203	206	232
Psychiatry	20,901	23,683	24,196	24,689	25,379
Child psychiatry	2,067	2,557	2,618	2,877	2,897
Physical medicine and rehabilitation	1,443	1,615	1,665	1,742	1,851
Radiology	10,380	11,417	11,627	12,062	11,495
Diagnostic radiology	1,941	3,500	3,794	4,236	5,388
Therapeutic radiology	855	1,161	1,202	1,305	1,389
Miscellaneous[3]	26,082	20,796	19,139	22,783	26,082

[1] Includes general practice and family practice.

[2] Includes gastroenterology, pulmonary diseases, allergy, and cardiovascular diseases.

[3] Includes occupational medicine, general preventive medicine, aerospace medicine, public health, other specialties not listed, and unspecified specialties.

NOTE: Active Federal and non-Federal doctors of medicine (M.D.'s) in the 50 States and the District of Columbia are included. Physicians not classified, inactive physicians, and physicians with unknown address in the United States are excluded. For 1978, this includes 25,102 physicians not classified, 26,698 physicians inactive, and 9,291 physicians with unknown address.

SOURCES: Haug, J.N., Roback, G.A., and Martin, B.C.: *Distribution of Physicians in the United States, 1970.* Chicago. American Medical Association, 1971. (Copyright 1971: Used with the permission of the American Medical Association.); Goodman, L.J., and Mason, H.R.: *Physician Distribution and Medical Licensure in the U.S., 1975.* Chicago. American Medical Association, 1976. (Copyright 1976: Used with the permission of the American Medical Association.); Goodman, L.J.: *Physician Distribution and Medical Licensure in the U.S., 1976.* Chicago. American Medical Association, 1977. (Copyright 1977: Used with the permission of the American Medical Association.); Department of Statistical Analysis: *Physician Distribution and Medical Licensure in the U.S., 1977.* Chicago. American Medical Association, 1979. (Copyright 1979: Used with the permission of the American Medical Association.); Department of Statistical Analysis: *Physician Distribution and Medical Licensure in the U.S., 1978.* Chicago. American Medical Association, 1980. (Copyright 1980: Used with the permission of the American Medical Association.)

Table 50. Active non-Federal physicians (M.D.'s) per 10,000 civilian population, according to geographic region, primary specialty, and activity: United States, 1973 and 1978

(Data are based on reporting by physicians)

Year, specialty, and activity	*United States*	*Geographic region*			
		Northeast	*North Central*	*South*	*West*
1973	*Number of physicians per 10,000 civilian population*				
Total[1]	14.8	19.0	12.8	12.3	16.9
Patient care	13.0	16.3	11.4	10.9	14.9
Office based	9.5	10.7	8.2	8.3	11.9
Hospital based	3.5	5.6	3.1	2.5	3.0
Other professional activities[2]	1.2	1.7	0.9	0.9	1.3
Primary care[3]	5.5	6.7	4.9	4.6	6.3
Patient care	5.1	6.2	4.7	4.3	5.9
Office based	4.0	4.4	3.7	3.5	4.9
Hospital based	1.2	1.8	1.0	0.8	1.0
Other professional activities[2]	0.3	0.5	0.2	0.2	0.3
Other medical specialties[4]	0.7	1.0	0.6	0.6	0.9
Patient care	0.6	0.9	0.5	0.5	0.8
Office based	0.6	0.7	0.4	0.5	0.7
Hospital based	0.1	0.1	0.1	0.1	0.1
Other professional activities[2]	0.1	0.1	0.1	0.1	0.1
Surgical specialties[5]	4.1	4.9	3.5	3.7	4.6
Patient care	3.9	4.7	3.4	3.6	4.4
Office based	3.0	3.4	2.5	2.8	3.7
Hospital based	0.9	1.3	0.8	0.8	0.7
Other professional activities[2]	0.1	0.2	0.1	0.1	0.2
1978					
Total[1]	17.4	21.5	15.2	15.3	19.4
Patient care	14.9	17.9	13.1	13.2	16.8
Office based	10.9	12.1	9.5	1.0	13.4
Hospital based	4.0	5.8	3.6	3.2	3.4
Other professional activities[2]	1.4	2.0	1.1	1.1	1.5
Primary care[3]	6.2	7.4	5.7	5.4	6.8
Patient care	5.8	6.8	5.4	5.1	6.4
Office based	4.3	4.6	4.0	3.8	5.1
Hospital based	1.5	2.1	1.4	1.2	1.3
Other professional activities[2]	0.4	0.6	0.4	0.4	0.4
Other medical specialties[4]	1.0	1.3	0.8	0.8	1.1
Patient care	0.8	1.1	0.6	0.7	1.0
Office based	0.7	0.9	0.6	0.7	0.9
Hospital based	0.1	0.1	0.1	0.1	0.1
Other professional activities[2]	0.1	0.2	0.1	0.1	0.1

See footnotes at end of table

Table 50. Active non-Federal physicians (M.D.'s) per 10,000 civilian population, according to geographic region, primary specialty, and activity: United States, 1973 and 1978—Continued

(Data are based on reporting by physicians)

Year, specialty, and activity	United States	Geographic region			
		Northeast	North Central	South	West
	Number of physicians per 10,000 civilian population				
Surgical specialties[5]	4.5	5.2	3.8	4.2	4.9
Patient care	4.3	5.0	3.7	4.1	4.7
Office based	3.4	3.7	2.8	3.3	4.0
Hospital based	1.0	1.3	0.9	0.8	0.8
Other professional activities[2]	0.2	0.2	0.1	0.1	0.2

[1] Includes active non-Federal doctors of medicine (M.D.'s) in all other specialties not shown separately and those not classified.

[2] Includes medical teaching, administration, research, and other professional activities.

[3] Includes general practice, internal medicine, and pediatrics.

[4] Includes dermatology, pediatric allergy, pediatric cardiology, gastroenterology, pulmonary diseases, allergy, and cardiovascular diseases.

[5] Includes general and neurological surgery, obstetrics and gynecology, ophthalmology, orthopedic surgery, otolaryngology, plastic surgery, colon and rectal surgery, thoracic surgery, and urology.

SOURCES: Roback, G.A.: *Distribution of Physicians in the U.S., 1973.* Chicago. American Medical Association, 1973. (Copyright 1974. Used with the permission of the American Medical Association.); Department of Statistical Analysis: *Physician Distribution and Medical Licensure in the U.S., 1978.* Chicago. American Medical Association, 1980. (Copyright 1980. Used with the permission of the American Medical Association.); U.S. Bureau of the Census: Population estimates and projections. *Current Population Reports.* Series P-25, Nos. 727 and 868. Washington. U.S. Government Printing Office, July 1978 and Nov. 1979.

Table 51. Graduates of health professions schools and number of schools, according to profession: United States, selected 1950-78 estimates and 1980 and 1990 projections

(Data are based on reporting by health professions schools)

Year	Profession				
	Medicine	Osteopathy	Dentistry	Optometry	Pharmacy
	Number of graduates				
1950	5,553	373	2,565	961	---
1960	7,081	427	3,253	364	3,497
1970	8,367	432	3,749	445	4,758
1975	12,714	702	4,969	806	6,886
1978	14,393	963	5,324	1,011	7,785
1980	15,346	1,029	5,380	1,046	6,900
1990	17,604	1,685	5,460	1,046	6,900
	Number of schools				
1950	79	6	42	10	---
1960	86	6	47	10	76
1970	103	7	53	11	74
1975	11[illegible]	9	59	12	73
1978	124	14	60	13	72
1980	124	14	60	13	72
1990	124	14	60	13	72

SOURCES: Bureau of Health Manpower: *A Report to the President and Congress on the Status of Health Professions Personnel in the United States.* DHEW Pub. No. (HRA) 78-93. Health Resources Administration. Hyattsville, Md., Aug. 1978; Division of Manpower Analysis, Bureau of Health Professions: *Supply of Manpower in Selected Health Occupations, 1950-1990.* HRA Pub. No. 80-35. Health Resources Administration. Hyattsville, Md., Jan. 1980, and selected data.

Table 52. Professionally active physicians (M.D.'s), according to primary specialty: United States and outlying U.S. areas, 1975 and 1979 estimates and 1980, 1985, and 1990 projections

(Data are based on reporting by physicians and medical schools)

Primary specialty	Year				
	1975	1979	1980	1985	1990
	Number of physicians				
All specialties	364,480	416,680	426,350	500,570	568,500
Primary care[1]	139,920	157,480	168,670	203,489	240,500
Other medical specialties	20,360	31,950	24,520	33,820	41,190
Surgical specialties	102,840	109,260	113,820	122,150	130,000
Other specialties	101,350	117,990	119,340	141,120	156,810

[1] Includes general practice, family practice, internal medicine, and pediatrics.

NOTE: Estimation and projection methods used are from the Bureau of Health Professions, Health Resources Administration. These data differ from American Medical Association data because a variant proportion of the physicians not classified by specialty is allocated into the data.

SOURCES: Bureau of Health Manpower: *A Report to the President and Congress on the Status of Health Professions Personnel in the United States.* DHEW Pub. No. (HRA)78-93. Health Resources Administration. Hyattsville, Md., Aug. 1978; Division of Manpower Analysis, Bureau of Health Professions: *Supply of Manpower in Selected Health Occupations, 1950-1990.* HRA Pub. No. 80-35. Health Resources Administration. Hyattsville, Md., Jan. 1980, and selected data.

Table 53. Short-stay hospitals and beds, according to type of hospital and ownership: United States, 1973 and 1978

(Data are based on reporting by facilities)

Year and type of ownership	All short-stay hospitals	Community hospitals			All other hospitals			
		Total	General	Specialty	Total	General	Psychiatric	Other
1973					*Number of hospitals*			
All ownerships	6,711	6,132	5,994	138	579	432	106	41
Government	2,255	1,818	1,802	16	437	407	21	9
Federal	346	-	-	-	346	345	-	1
State-local	1,909	1,818	1,802	16	91	62	21	8
Proprietary	931	858	817	41	73	-	49	24
Nonprofit	3,525	3,456	3,375	81	69	25	36	8
1978								
All ownerships	6,595	5,992	5,850	142	603	396	153	54
Government	2,251	1,819	1,798	21	432	375	43	14
Federal	332	-	-	-	332	330	-	2
State-local	1,919	1,819	1,798	21	100	45	43	12
Proprietary	885	791	756	35	94	-	68	26
Nonprofit	3,459	3,382	3,296	86	77	21	42	14
1973					*Number of beds*			
All ownerships	1,034,422	926,793	916,048	10,745	107,629	96,361	8,949	2,319
Government	309,300	209,620	207,368	2,252	99,680	95,579	3,006	1,095
Federal	92,361	-	-	-	92,361	91,845	-	516
State-local	216,939	209,620	207,368	2,252	7,319	3,734	3,006	579
Proprietary	74,133	69,905	68,314	1,591	4,228	-	3,415	813
Nonprofit	650,989	647,268	640,366	6,902	3,721	782	2,528	4[illegible]
1978								
All ownerships	1,100,368	987,490	974,018	13,472	112,878	89,308	19,742	3,828
Government	315,433	212,773	209,317	3,456	102,660	88,717	11,807	2,136
Federal	86,847	-	-	-	86,847	85,897	-	950
State-local	228,586	212,773	209,317	3,456	15,813	2,820	11,807	1,186
Proprietary	91,018	85,375	83,609	1,766	5,643	-	4,708	935
Nonprofit	693,917	689,342	681,092	8,250	4,575	591	3,227	757

NOTE: Community hospitals include all non-Federal short-stay hospitals classified by the American Hospital Association according to one of the following services: general medical and surgical; obstetrics and gynecology; eye, ear, nose, and throat; rehabilitation; orthopedic; other specialty; children's general; children's eye, ear, nose, and throat; children's rehabilitation; children's orthopedic; and children's other specialty.

SOURCE: Division of Health Manpower and Facilities Statistics, National Center for Health Statistics: Data from the National Master Facility Inventory.

Table 54. Community hospital beds per 1,000 population and average annual rate of change, according to geographic division and State: United States, selected years 1940-78

(Data are based on reporting by facilities)

Geographic division and State	Year							Period			
	1940[1]	1950[1]	1960[2]	1970	1975	1977	1978	1940-60[1,2]	1960-70[2]	1970-75	1975-78
	Community hospital beds per 1,000 population[3]							Average annual rate of change			
United States	3.2	3.3	3.6	4.3	4.6	4.6	4.6	0.6	1.8	1.4	-
New England	4.4	4.2	3.9	4.1	4.2	4.2	4.2	-0.6	0.5	0.5	-
Maine	3.0	3.2	3.4	4.7	4.7	4.8	4.9	0.6	3.3	-	0.7
New Hampshire	4.2	4.2	4.4	4.0	4.2	4.0	4.0	0.2	-0.9	1.0	-1.6
Vermont	3.3	4.0	4.5	4.5	4.8	4.7	4.6	1.6	-	1.3	-1.4
Massachusetts	5.1	4.8	4.2	4.4	4.6	4.6	4.5	-1.0	0.5	0.9	-0.7
Rhode Island	3.9	3.8	3.7	4.0	3.8	3.7	3.7	-0.3	0.8	-1.0	-0.9
Connecticut	3.7	3.6	3.4	3.4	3.5	3.5	3.5	-0.4	-	0.6	-
Middle Atlantic	3.9	3.8	4.0	4.4	4.6	4.6	4.6	0.1	1.0	0.9	-
New York	4.3	4.1	4.3	4.6	4.7	4.7	4.6	-	0.7	0.4	-0.7
New Jersey	3.5	3.2	3.1	3.6	4.0	4.1	4.2	-0.6	1.5	2.1	1.6
Pennsylvania	3.5	3.8	4.1	4.7	4.7	4.8	4.8	0.8	1.4	-	0.7
East North Central	3.2	3.2	3.6	4.4	4.7	4.7	4.7	0.6	2.0	1.3	-
Ohio	2.7	2.9	3.4	4.2	4.5	4.7	4.7	1.2	2.1	1.8	0.7
Indiana	2.3	2.6	3.1	4.0	4.4	4.5	4.5	1.5	2.6	1.9	0.8
Illinois	3.4	3.6	4.0	4.7	4.9	5.0	5.0	0.8	1.6	0.8	0.7
Michigan	4.0	3.3	3.3	4.3	4.5	4.5	4.4	-1.0	2.7	0.9	-0.7
Wisconsin	3.4	3.7	4.3	5.2	5.1	5.0	5.1	1.2	1.9	-0.4	-
West North Central	3.1	3.7	4.3	5.7	5.8	5.9	5.9	1.6	2.9	0.3	0.6
Minnesota	3.9	4.4	4.8	6.1	6.0	5.9	6.0	1.0	2.4	-0.3	-
Iowa	2.7	3.2	3.9	5.6	6.0	5.8	5.8	1.9	3.7	1.4	-1.1
Missouri	2.9	3.3	3.9	5.1	5.5	5.8	5.8	1.5	2.7	1.5	1.8
North Dakota	3.5	4.3	5.2	6.8	6.7	7.1	7.1	2.0	2.7	-0.3	2.0
South Dakota	2.8	4.4	4.5	5.6	5.5	5.7	5.5	2.4	2.2	-0.4	-
Nebraska	3.4	4.2	4.4	6.2	6.1	6.1	6.1	1.3	3.5	-0.3	-
Kansas	2.8	3.4	4.2	5.4	5.7	5.8	5.8	2.0	2.5	1.1	0.6
South Atlantic	2.5	2.8	3.3	4.0	4.3	4.5	4.5	1.4	1.9	1.5	1.5
Delaware	4.4	3.9	3.7	3.7	3.5	3.7	3.7	-0.9	-	-1.1	1.9
Maryland	3.9	3.6	3.3	3.1	3.2	3.3	3.4	-0.8	-0.6	0.6	2.0
District of Columbia	5.5	5.5	5.9	7.4	7.1	7.2	7.3	0.4	2.3	-0.8	0.9
Virginia	2.2	2.5	3.0	3.7	4.1	4.1	4.1	1.6	2.1	2.1	-
West Virginia	2.7	3.1	4.1	5.4	5.8	5.6	5.6	2.1	2.8	1.4	-1.2
North Carolina	2.2	2.6	3.4	3.8	4.0	4.2	4.2	2.2	1.1	1.0	1.6
South Carolina	1.8	2.4	2.9	3.7	3.9	3.9	3.9	2.4	2.5	1.1	-
Georgia	1.7	2.0	2.8	3.8	4.4	4.6	4.6	2.5	3.1	3.0	1.5
Florida	2.8	2.9	3.1	4.4	4.9	5.1	5.1	0.5	3.6	2.2	1.3
East South Central	1.7	2.1	3.0	4.4	4.9	5.0	5.1	2.9	3.9	2.2	1.3
Kentucky	1.8	2.2	3.0	4.0	4.3	4.4	4.4	2.6	2.9	1.5	[illegible]
Tennessee	1.9	2.3	3.4	4.7	5.4	5.5	5.5	3.0	3.3	2.3	[illegible]
Alabama	1.5	2.0	2.8	4.3	4.9	5.0	5.1	3.2	4.4	2.6	1.3
Mississippi	1.4	1.7	2.9	4.4	4.9	5.1	5.2	3.7	4.3	2.2	2.0

See footnotes at end of table.

Table 54. Community hospital beds per 1,000 population and average annual rate of change, according to geographic division and State: United States, selected years 1940-78—Continued

(Data are based on reporting by facilities)

Geographic division and State	Year							Period			
	1940[1]	1950[1]	1960[2]	1970	1975	1977	1978	1940-60[1,2]	1960-70[2]	1970-75	1975-78
	Community hospital beds per 1,000 population[3]							*Average annual rate of change*			
West South Central	2.1	2.7	3.3	4.3	4.7	4.7	4.7	2.3	2.7	1.8	-
Arkansas	1.4	1.6	2.9	4.2	4.6	4.8	4.9	3.7	3.8	1.8	2.1
Louisiana	3.1	3.8	3.9	4.2	4.7	4.7	4.7	1.2	0.7	2.3	-
Oklahoma	1.9	2.5	3.2	4.5	4.6	4.6	4.6	2.6	3.5	0.4	-
Texas	2.0	2.7	3.3	4.3	4.7	4.7	4.7	2.5	2.7	1.8	-
Mountain	3.6	3.8	3.5	4.3	4.0	3.9	3.9	-0.1	2.1	-1.4	-0.8
Montana	4.9	5.3	5.1	5.8	5.2	5.1	5.7	0.2	1.3	-2.2	3.1
Idaho	2.6	3.4	3.2	4.0	3.9	3.9	3.7	1.0	2.3	-0.5	-1.7
Wyoming	3.5	3.9	4.6	5.5	4.5	4.2	3.9	1.4	1.8	-3.9	-4.7
Colorado	3.9	4.2	3.8	4.6	4.4	4.4	4.2	-0.1	1.9	-0.9	-1.5
New Mexico	2.7	2.2	2.9	3.5	3.4	3.2	3.2	0.4	1.9	-0.6	-2.0
Arizona	3.4	4.0	3.0	4.1	3.8	3.8	3.8	-0.6	3.2	-1.5	-
Utah	3.2	2.9	2.8	3.6	3.2	3.1	3.2	-0.7	2.5	-2.3	-
Nevada	5.0	4.4	3.9	4.2	4.3	4.1	4.1	-1.2	0.7	0.5	-1.6
Pacific	4.1	3.2	3.1	3.7	3.9	3.8	3.6	-1.4	1.8	1.1	-2.6
Washington	3.4	3.6	3.3	3.5	3.4	3.3	3.2	-0.1	0.6	-0.6	-2.0
Oregon	3.5	3.1	3.5	4.0	3.9	3.8	3.6	-	1.3	-0.5	-2.6
California	4.4	3.3	3.0	3.8	4.0	3.9	3.8	-1.9	2.4	1.0	-1.7
Alaska	...	...	2.4	2.3	2.2	2.4	2.3	...	-0.4	-0.9	1.5
Hawaii	...	...	3.7	3.4	3.3	3.1	3.1	...	-0.8	-0.6	-2.1

[1] 1940 and 1950 data are estimated based on published figures.

[2] 1960 includes hospital units of institutions.

[3] Civilian population.

NOTE: Community hospitals include all non-Federal short-stay hospitals classified by the American Hospital Association according to one of the following services: general medical and surgical; obstetrics and gynecology; eye, ear, nose, and throat; rehabilitation; orthopedic; other specialty; children's general; children's eye, ear, nose, and throat; children's rehabilitation; children's orthopedic; and children's other specialty.

SOURCES: American Medical Association: Hospital service in the United States. *JAMA* 116(11): 1055-1144, 1941, and 146(2): 109-184, 1951. (Copyright 1941 and 1951: Used with the permission of the American Medical Association.); American Hospital Association: Hospitals. *JAHA* 35(15): 383-430, Aug. 1, 1961. (Copyright 1961: Used with the permission of the American Hospital Association.); Division of Health Manpower and Facilities Statistics, National Center for Health Statistics: Data from the National Master Facility Inventory; U.S. Bureau of the Census: *Current Population Reports*. Series P-25, Nos. 72, 304, 460, 640, 642, 790, and 868. Washington. U.S. Government Printing Office, 1953, 1965, 1971, 1976, 1978, and 1979, and unpublished data.

Table 55. Occupancy rate in community hospitals and average annual rate of change, according to geographic division and State: United States, selected years 1940-78

(Data are based on reporting by facilities)

Geographic division and State	Year						Period			
	1940[1]	1960[2]	1970	1975	1977	1978	1940-60[1,2]	1960-70[2]	1970-75	1975-78
	Percent of beds occupied						*Average annual rate of change*			
United States	69.9	74.7	77.3	74.2	73.3	73.2	0.3	0.3	-0.8	-0.5
New England	72.5	75.2	79.7	77.6	77.3	77.6	0.2	0.6	-0.5	0.0
Maine	72.4	73.2	73.0	71.1	69.3	71.7	0.1	-0.0	-0.5	0.3
New Hampshire	65.3	66.5	73.4	71.4	71.7	71.5	0.1	1.0	-0.6	0.0
Vermont	68.8	68.5	76.3	70.7	75.3	72.2	-0.0	1.1	-1.5	0.7
Massachusetts	71.8	75.8	80.3	79.1	78.5	79.2	0.3	0.6	-0.3	0.0
Rhode Island	77.7	75.7	82.9	82.2	82.0	82.3	-0.1	0.9	-0.2	0.0
Connecticut	75.9	78.2	82.6	78.6	78.8	78.1	0.1	0.5	-1.0	-0.2
Middle Atlantic	75.5	78.1	82.4	81.4	81.3	81.1	0.2	0.5	-0.2	-0.1
New York	78.9	79.4	82.9	84.2	83.8	83.1	0.0	0.4	0.3	-0.4
New Jersey	72.4	78.4	82.5	81.1	81.7	81.8	0.4	0.5	-0.3	0.3
Pennsylvania	71.3	76.0	81.5	77.2	77.3	77.9	0.3	0.7	-1.1	0.3
East North Central	71.0	78.4	79.5	77.2	75.7	75.4	0.5	0.1	-0.6	-0.8
Ohio	72.1	81.3	81.8	80.6	78.6	78.0	0.6	0.1	-0.3	-1.1
Indiana	68.5	79.6	80.3	76.4	76.0	75.7	0.8	0.1	-1.0	-0.3
Illinois	73.1	76.0	79.3	75.7	75.1	74.9	0.2	0.4	-0.9	-0.4
Michigan	71.5	80.5	80.6	78.8	76.1	76.3	0.6	0.0	-0.5	-1.1
Wisconsin	65.2	73.9	73.2	71.5	69.5	69.6	0.6	-0.1	-0.5	-0.9
West North Central	65.7	71.8	73.6	70.6	69.3	69.4	0.4	0.2	-0.3	-0.6
Minnesota	71.0	72.3	73.9	70.7	70.5	70.2	0.1	0.2	-0.9	-0.2
Iowa	63.6	72.6	71.9	67.4	66.4	67.1	0.7	-0.1	-1.3	-0.1
Missouri	68.6	75.8	79.3	75.9	73.5	73.5	0.5	0.5	-0.9	-1.1
North Dakota	61.9	71.3	67.1	69.1	66.5	66.2	0.7	-0.6	0.6	-1.4
South Dakota	59.1	66.0	66.3	63.8	62.0	59.3	0.6	0.0	-0.8	-2.4
Nebraska	59.0	65.6	69.9	65.8	65.0	66.2	0.5	0.6	-1.2	0.2
Kansas	60.4	69.1	71.4	69.9	68.3	68.3	0.7	0.3	-0.4	-0.8
South Atlantic	66.7	74.8	77.9	73.9	73.2	73.0	0.6	0.4	-1.0	-0.4
Delaware	59.2	70.2	78.8	81.0	81.0	80.6	0.9	1.2	0.6	-0.2
Maryland	74.6	73.9	79.3	79.3	82.8	81.0	-0.0	0.7	-	0.7
District of Columbia	76.2	80.8	77.7	78.9	78.6	77.0	0.3	-0.4	0.3	-0.8
Virginia	70.0	78.0	81.1	77.4	75.9	74.5	0.5	0.4	-0.9	-1.3
West Virginia	62.1	74.5	79.3	75.3	73.8	72.3	0.9	0.6	-1.0	-1.3
North Carolina	64.6	73.9	78.5	77.4	75.7	75.7	0.7	0.6	-0.3	-0.7
South Carolina	69.1	76.9	76.4	74.2	74.1	74.1	0.5	-0.1	-0.6	0.0
Georgia	62.7	71.7	76.5	68.2	67.0	67.4	0.7	0.7	-2.3	-0.4
Florida	57.5	73.9	76.2	70.2	69.5	70.3	1.3	0.3	-1.6	0.0
East South Central	62.6	71.6	78.2	74.0	73.5	73.3	0.7	0.9	-1.1	-0.3
Kentucky	61.6	73.4	79.6	77.3	76.6	75.8	0.9	0.8	-0.6	-0.7
Tennessee	65.5	75.9	78.2	74.4	73.4	73.8	0.7	0.3	-1.0	-0.3
Alabama	59.0	70.8	80.0	72.6	72.9	72.5	0.9	1.2	-1.9	0.0
Mississippi	63.8	62.8	73.6	71.4	70.9	70.6	-0.1	1.6	-0.6	-0.4

See footnotes at end of table.

Table 55. Occupancy rate in community hospitals and average annual rate of change, according to geographic division and State: United States, selected years 1940-78—Continued

(Data are based on reporting by facilities)

Geographic division and State	Year						Period			
	1940[1]	1960[2]	1970	1975	1977	1978	1940-60[1,2]	1960-70[2]	1970-75	1975-78
	Percent of beds occupied						*Average annual rate of change*			
West South Central	62.5	68.7	73.2	69.1	67.5	67.5	0.5	0.6	-1.1	-0.8
Arkansas	55.6	70.0	74.4	70.3	68.4	68.9	1.2	0.6	-1.1	-0.7
Louisiana	75.0	67.9	73.6	68.8	68.9	68.4	-0.5	0.8	-1.3	-0.2
Oklahoma	54.5	71.0	72.5	69.3	66.1	66.5	1.3	0.2	-0.9	-1.4
Texas	59.6	68.2	73.0	69.0	67.3	67.2	0.7	0.7	-1.1	-0.9
Mountain	60.9	69.9	71.2	68.4	66.6	66.8	0.7	0.2	-0.8	-0.8
Montana	62.8	60.3	65.9	61.4	59.3	64.0	-0.2	0.9	-1.4	1.4
Idaho	65.4	55.9	66.1	68.2	65.9	65.9	-0.8	1.7	0.6	-1.1
Wyoming	47.5	61.1	63.1	55.9	53.6	54.6	1.3	0.3	-2.4	-0.8
Colorado	62.1	80.6	74.0	69.1	68.0	67.4	1.3	-0.9	-1.4	-0.3
New Mexico	47.8	65.1	69.8	63.6	62.8	65.0	1.6	0.7	-1.8	0.7
Arizona	61.2	74.2	73.3	73.5	71.0	71.3	1.0	-0.1	0.1	-1.0
Utah	65.8	70.0	73.7	73.6	69.4	66.5	0.3	0.5	-0.0	-3.3
Nevada	67.9	70.7	72.7	67.2	67.7	66.1	0.2	0.3	-1.6	-0.5
Pacific	69.7	71.4	71.0	66.2	66.0	66.1	0.1	-0.1	-1.4	-0.1
Washington	67.5	63.4	69.7	67.7	65.9	66.6	-0.3	1.0	-0.6	-0.5
Oregon	71.2	65.8	69.3	66.6	66.8	65.8	-0.4	0.5	-0.8	-0.4
California	69.9	74.3	71.3	66.0	65.8	65.9	0.3	-0.4	-1.5	-0.1
Alaska	...	53.8	59.1	63.3	59.5	60.5	...	0.9	1.4	-1.5
Hawaii	...	61.5	75.7	68.1	72.7	72.8	...	2.1	-2.1	2.2

[1] 1940 data are estimated based on published figures.

[2] 1960 includes hospital units of institutions.

NOTE: Community hospitals include all non-Federal short-stay hospitals classified by the American Hospital Association according to one of the following services: general medical and surgical; obstetrics and gynecology; eye, ear, nose, and throat; rehabilitation; orthopedic; other specialty; children's general; children's eye, ear, nose, and throat; children's rehabilitation; children's orthopedic; and children's other specialty.

SOURCES: American Medical Association: Hospital service in the United States. *JAMA* 116(11): 1055-1144, 1941. (Copyright 1941: Used with the permission of the American Medical Association.); American Hospital Association: Hospitals. *JAHA* 35(15): 383-430, Aug. 1, 1961. (Copyright 1961: Used with the permission of the American Hospital Association.); Division of Health Manpower and Facilities Statistics, National Center for Health Statistics: Data from the National Master Facility Inventory.

Table 56. Full-time equivalent employees per 100 average daily patients in community hospitals and average annual rate of change, according to geographic division and State: United States, selected years 1960-78

(Data are based on reporting by facilities)

Geographic division and State	Year					Period		
	1960[1]	1970	1975	1977	1978	1960-70[1]	1970-75	1975-78
	Number of employees per 100 average daily patients					Average annual rate of change		
United States	226	302	349	369	379	2.9	2.9	2.8
New England	249	351	412	432	436	3.5	3.3	1.9
Maine	227	289	359	401	402	2.4	4.4	3.8
New Hampshire	240	310	347	375	383	2.6	2.3	3.3
Vermont	227	318	346	332	[illegible]	3.4	1.7	0.0
Massachusetts	252	365	436	453	456	3.8	3.6	1.5
Rhode Island	270	383	433	460	460	3.6	2.5	2.0
Connecticut	247	347	397	421	428	3.5	2.7	2.5
Middle Atlantic	225	311	352	362	372	3.3	2.5	1.9
New York	233	336	375	375	386	3.7	2.2	1.0
New Jersey	225	278	308	320	328	2.1	2.1	2.1
Pennsylvania	214	287	340	364	375	3.0	3.4	3.3
East North Central	226	299	343	368	379	2.8	2.8	3.4
Ohio	232	302	334	360	372	2.7	2.0	3.7
Indiana	216	280	320	346	351	2.6	2.7	3.1
Illinois	226	301	357	379	391	2.9	3.5	3.1
Michigan	239	313	364	386	401	2.7	3.1	3.3
Wisconsin	199	277	315	350	358	3.4	2.6	4.4
West North Central	212	273	305	332	335	2.6	2.2	3.2
Minnesota	220	273	296	325	317	2.2	1.6	2.3
Iowa	208	258	293	325	335	2.2	2.6	4.6
Missouri	217	289	326	353	357	2.9	2.4	3.1
North Dakota	177	254	273	292	299	3.7	1.5	3.1
South Dakota	188	247	294	306	343	2.8	3.5	5.3
Nebraska	220	276	298	315	310	2.3	1.5	1.3
Kansas	210	270	313	338	347	2.5	3.0	3.5
South Atlantic	217	295	343	358	368	3.1	3.1	2.4
Delaware	243	328	390	394	403	3.0	3.5	1.1
Maryland	237	354	391	387	401	4.1	2.0	0.8
District of Columbia	240	363	443	494	497	4.2	4.1	3.9
Virginia	193	289	323	326	333	4.1	2.2	1.0
West Virginia	198	255	298	321	335	2.6	3.2	4.0
North Carolina	196	277	319	340	350	3.5	2.9	3.1
South Carolina	185	257	302	330	338	3.3	3.3	3.8
Georgia	233	294	364	381	396	2.4	4.4	2.8
Florida	245	295	346	361	367	1.9	3.2	2.0
East South Central	227	275	306	321	328	1.9	2.2	2.3
Kentucky	229	276	292	304	316	1.9	1.1	2.7
Tennessee	231	284	315	330	333	2.1	2.1	1.9
Alabama	233	266	308	328	337	1.3	3.0	3.0
Mississippi	207	270	300	315	317	2.7	2.1	1.9

See footnote at end of table.

Table 58. Full-time equivalent employees per 100 average daily patients in community hospitals and average annual rate of change, according to geographic division and State: United States, selected years 1960-78—Continued

(Data are based on reporting by facilities)

Geographic division and State	*Year*					*Period*		
	1960[1]	*1970*	*1975*	*1977*	*1978*	*1960-70*[1]	*1970-75*	*1975-78*
	Number of employees per 100 average daily patients					*Average annual rate of change*		
West South Central	225	297	346	364	372	2.8	3.1	2.4
Arkansas	209	274	318	332	329	2.7	3.0	1.1
Louisiana	218	292	354	363	373	3.0	3.9	1.8
Oklahoma	218	296	359	383	385	3.1	3.9	2.4
Texas	232	304	346	367	376	2.7	2.6	2.8
Mountain	226	299	364	392	402	2.8	4.0	3.4
Montana	216	247	301	342	291	1.4	4.0	-1.1
Idaho	255	281	321	343	359	1.0	2.7	3.8
Wyoming	217	251	344	397	416	1.5	6.5	6.5
Colorado	221	306	373	383	413	3.3	4.0	3.5
New Mexico	228	314	389	455	418	3.3	4.4	2.4
Arizona	222	327	381	406	432	3.9	3.1	4.3
Utah	243	304	388	422	439	2.3	5.0	4.2
Nevada	224	284	344	380	398	2.4	3.9	5.0
Pacific	243	327	401	435	454	3.0	4.2	4.2
Washington	263	313	382	414	422	1.8	4.1	3.4
Oregon	232	303	387	393	432	2.7	5.0	3.7
California	241	334	407	445	463	3.3	4.0	4.4
Alaska	220	301	385	445	456	3.2	5.0	5.8
Hawaii	226	278	357	375	389	2.1	5.1	2.9

[1] 1960 includes hospital units of institutions, but excludes students, interns, and residents.

NOTE: Community hospitals include all non-Federal short-stay hospitals classified by the American Hospital Association according to one of the following services: general medical and surgical; obstetrics and gynecology; eye, ear, nose, and throat; rehabilitation; orthopedic; other specialty; children's general; children's eye, ear, nose, and throat; children's rehabilitation; children's orthopedic; and children's other specialty.

SOURCES: American Hospital Association: Hospitals. *JAHA* 35(15): 383-430, Aug. 1, 1961. (Copyright 1961: Used with the permission of the American Hospital Association.) Division of Health Manpower and Facilities Statistics, National Center for Health Statistics: Data from the National Master Facility Inventory.

Table 57. Outpatient visits per 1,000 patient days in community hospitals and average annual rate of change, according to geographic division and State: United States, selected years 1970-78

(Data are based on reporting by facilities)

Geographic division and State	Year				Period	
	1970	1975	1977	1978	1970-75	1975-78
	Outpatient visits per 1,000 patient days				Average annual rate of change	
United States	568	738	760	769	5.4	1.4
New England	676	955	1,006	1,036	7.2	2.8
Maine	596	940	1,129	1,168	9.5	7.5
New Hampshire	811	1,070	1,183	1,234	5.7	4.9
Vermont	596	954	957	1,046	9.9	3.1
Massachusetts	704	940	1,005	1,031	6.0	3.1
Rhode Island	620	845	[illegible]	869	6.4	0.9
Connecticut	640	1,006	979	986	9.5	-0.7
Middle Atlantic	647	906	901	912	7.0	0.2
New York	658	896	922	913	6.4	0.6
New Jersey	517	706	666	683	6.4	-1.1
Pennsylvania	691	1,034	1,001	1,040	8.4	0.2
East North Central	513	732	756	762	7.4	1.3
Ohio	502	670	700	702	5.9	1.6
Indiana	484	741	787	775	8.9	1.5
Illinois	531	735	738	768	6.7	1.5
Michigan	588	885	905	875	8.5	-0.4
Wisconsin	381	573	623	662	8.5	4.9
West North Central	373	499	543	512	6.0	0.9
Minnesota	309	387	443	442	4.6	4.5
Iowa	348	525	609	573	8.6	3.0
Missouri	468	573	577	525	4.1	-2.9
North Dakota	150	211	279	267	7.1	8.2
South Dakota	314	308	432	421	-0.4	11.0
Nebraska	264	401	456	444	8.7	3.5
Kansas	494	724	743	681	7.9	-2.0
South Atlantic	547	697	675	668	5.0	-1.4
Delaware	674	1,036	965	945	9.0	-3.0
Maryland	809	991	934	910	4.1	-2.8
District of Columbia	749	924	898	841	4.3	-3.1
Virginia	557	682	612	637	4.1	-2.2
West Virginia	635	792	759	747	4.5	-1.9
North Carolina	509	664	714	691	5.5	1.3
South Carolina	456	608	670	667	5.9	3.1
Georgia	489	679	704	716	6.8	1.8
Florida	442	570	509	502	5.2	-4.1
East South Central	401	498	514	502	4.4	0.3
Kentucky	448	558	560	577	4.5	1.1
Tennessee	441	526	518	482	3.6	-2.9
Alabama	344	422	506	486	4.2	4.8
Mississippi	349	475	458	465	6.4	-0.7

See footnotes at end of table.

Table 57. Outpatient visits per 1,000 patient days in community hospitals and average annual rate of change, according to geographic division and State: United States, selected years 1970-78—Continued

(Data are based on reporting by facilities)

Geographic division and State	*Year*				*Period*	
	1970	*1975*	*1977*	*1978*	*1970-75*	*1975-78*
	Outpatient visits per 1,000 patient days				*Average annual rate of change*	
West South Central	442	528	584	578	3.6	3.1
Arkansas	306	432	464	484	7.1	3.9
Louisiana	693	756	906	900	1.8	6.0
Oklahoma	292	397	467	471	6.3	5.9
Texas	421	502	528	515	3.6	0.9
Mountain	525	781	912	951	8.3	6.8
Montana	337	538	607	726	9.8	10.5
Idaho	514	748	787	921	7.8	7.2
Wyoming	342	670	831	1,060	14.4	16.5
Colorado	532	856	888	910	10.0	2.1
New Mexico	435	690	1,067	1,028	9.7	14.2
Arizona	648	780	865	950	3.8	6.8
Utah	677	1,015	1,400	1,359	8.4	10.2
Nevada	395	633	811	730	9.9	4.9
Pacific	923	935	987	1,085	0.3	5.1
Washington	538	816	982	894	8.7	3.1
Oregon	612	773	869	964	4.8	7.6
California	1,006	954	979	1,112	-1.1	5.2
Alaska	747	1,388	876	1,035	13.2	-9.3
Hawaii	1,230	1,324	1,670	1,530	1.5	4.9

NOTE: Community hospitals include all non-Federal short-stay hospitals classified by the American Hospital Association according to one of the following services: general medical and surgical; obstetrics and gynecology; eye, ear, nose, and throat; rehabilitation; orthopedic; other specialty; children's general; children's eye, ear, nose, and throat; children's rehabilitation; children's orthopedic; and children's other specialty.

SOURCE: Division of Health Manpower and Facilities Statistics, National Center for Health Statistics: Data from the National Master Facility Inventory.

Table 58. Long-stay hospitals and beds, according to type of hospital and ownership: United States, 1973 and 1978

(Data are based on reporting by facilities)

Year and type of ownership	All long-stay hospitals	Type of hospital					
		General	Psychiatric	Tuberculosis	Rehabilitation	Chronic disease	Other
1973	Number of hospitals						
All ownerships	727	32	402	63	61	68	101
Government	489	30	300	58	12	44	45
Federal	51	20	27	-	-	-	4
State-local	438	10	273	58	12	44	41
Proprietary	69	1	55	-	1	6	6
Nonprofit	169	1	47	5	48	18	50
1978							
All ownerships	564	24	347	13	50	59	71
Government	356	19	243	12	13	40	29
Federal	39	12	24	-	-	-	3
State-local	317	7	219	12	13	40	26
Proprietary	73	2	56	-	5	3	7
Nonprofit	135	3	48	1	32	16	35
1973	Number of beds						
All ownerships	414,640	18,023	329,625	10,056	7,613	22,240	27,083
Government	386,959	17,724	319,669	9,687	3,432	18,488	17,959
Federal	46,683	14,516	29,572	-	-	-	2,595
State-local	340,276	3,208	290,097	9,687	3,432	18,488	15,364
Proprietary	6,451	237	5,157	-	262	391	404
Nonprofit	21,230	62	4,799	369	3,919	3,361	8,720
1978							
All ownerships	249,729	11,407	192,689	2,500	5,856	19,842	17,435
Government	224,820	10,969	180,981	2,401	2,302	16,533	11,614
Federal	33,762	9,245	23,056	-	-	-	1,461
State-local	191,058	1,744	157,925	2,401	2,302	16,533	10,153
Proprietary	7,130	148	5,589	-	638	288	467
Nonprofit	17,779	270	6,119	99	2,916	3,021	5,354

SOURCE: Division of Health Manpower and Facilities Statistics, National Center for Health Statistics: Data from the National Master Facility Inventory.

Table 59. Nursing home beds, annual occupancy rates, and resident days of care provided, according to selected facility characteristics: United States, 1972 and 1976

(Data are based on a sample of nursing homes)

Facility characteristic	Number of beds		Annual occupancy rate[2]		Resident days of care	
	1972[1]	1976	1972[1]	1976	1972[1]	1976
All facilities	1,165,100	1,389,900	86.51	88.76	368,906,000	451,522,500
Ownership						
Proprietary	823,400	963,800	86.42	89.37	260,449,600	315,225,700
Nonprofit	341,700	426,200	86.72	87.38	108,456,400	136,296,700
Certification[3]						
Skilled nursing facility	467,600	291,900	86.52	90.77	87,150,800	96,967,000
Skilled nursing and intermediate facility	286,600	543,700	83.08	88.58	148,050,200	176,286,000
Intermediate facility	250,800	386,400	89.17	87.33	81,848,400	123,523,000
Not certified	160,300	167,800	88.38	89.12	51,856,600	54,746,500
Bed size						
Less than 50 beds	179,600	183,800	89.16	92.53	58,611,900	60,921,000
50-99 beds	389,700	414,900	88.60	90.35	126,359,600	137,186,800
100-199 beds	410,000	538,200	86.27	87.64	129,437,700	172,649,500
200 beds or more	185,900	253,000	80.10	87.21	54,496,800	80,765,100
Geographic region						
Northeast	248,700	311,200	88.97	90.09	80,996,400	102,611,200
North Central	404,000	480,500	86.21	89.73	127,460,800	157,793,500
South	298,800	376,000	86.49	87.29	94,577,100	120,106,100
West	213,700	222,300	84.22	87.27	65,871,800	71,011,700

[1] Data for 1972 exclude personal care or domiciliary care homes.

[2] The annual occupancy rate reflects the occupancy rate for the entire year rather than a single day. The formula used to calculate occupancy rate was:

$$\text{occupancy rate} = \frac{\text{aggregate number of days of care provided to residents} \times 100}{\text{estimated number of beds} \times 366}$$

[3] Medicare extended care facilities and Medicaid skilled nursing homes from the 1973-74 survey were considered equivalent to Medicare and Medicaid skilled nursing facilities in 1977 for the purposes of this comparison.

SOURCES: National Center for Health Statistics: The National Nursing Home Survey: 1977 summary for the United States, by J.F. Van Nostrand, A. Zappolo, and E. Hing, et al. *Vital and Health Statistics*. Series 13-No. 43. DHEW Pub. No. (PHS) 79-1794. Public Health Service. Washington. U.S. Government Printing Office, July 1979; Utilization of nursing homes, United States, National Nursing Home Survey, August 1973-April 1974, by J.F. Sutton. *Vital and Health Statistics*. Series 13-No. 28. DHEW Pub. No. (HRA) 77-1779. Health Resources Administration. Washington. U.S. Government Printing Office, July 1977.

Table 80. Gross national product and national health expenditures: United States, selected years 1929-79

(Data are compiled by the Health Care Financing Administration)

Year	Gross national product in billions	National health expenditures		
		Amount in billions	Percent of gross national product	Amount per capita
1929	$ 103.4	$ 3.6	3.5	$ 29.49
1935	72.2	2.9	4.0	22.65
1940	100.0	4.0	4.0	29.62
1950	286.2	12.7	4.4	81.86
1955	398.0	17.7	4.4	105.38
1960	506.0	26.9	5.3	146.30
1965	688.1	42.0	6.1	212.32
1970	982.4	74.9	7.6	359.41
1971	1,063.4	83.1	7.8	394.71
1972	1,171.1	93.5	8.0	440.34
1973	1,306.5	103.0	7.9	481.65
1974	1,412.9	116.3	8.2	539.11
1975	1,528.8	132.1	8.6	607.58
1976	1,702.2	148.9	8.7	678.79
1977	1,899.5	169.9	8.9	768.30
1978	2,127.6	188.6	8.9	845.53
1979	2,368.8	212.2	9.0	942.94

SOURCE: Office of Research, Demonstrations, and Statistics: National health expenditures, 1979, by R.M. Gibson. *Health Care Financing Review*. HCFA Pub. No. 03054. Health Care Financing Administration. Washington. U.S. Government Printing Office, Summer 1980.

Table 61. Personal health care expenditures, average annual percent change, and percent distribution of factors affecting growth: United States, 1973-79

(Data are compiled by the Health Care Financing Administration)

Year	*Personal health care expenditures in millions*	*Average annual percent change*[1]	*Factors affecting growth*			
			All factors	*Prices*	*Population*	*Intensity*[2]
			Percent distribution			
1973-79	...	13.4	100.0	65.6	6.6	27.8
1973	$ 88,688	—	100.0	42.7	7.3	50.0
1974	101,007	13.9	100.0	65.5	6.1	28.4
1975	116,522	15.4	100.0	71.6	5.5	22.9
1976	131,[illegible]76	12.7	100.0	70.4	7.0	22.6
1977	147,968	12.7	100.0	64.7	6.6	28.7
1978	166,627	12.6	100.0	67.0	7.4	25.6
1979	188,551	13.2	100.0	71.9	6.8	21.3

[1] Refers to 1-year periods unless otherwise noted.

[2] Represents changes in use and/or kinds of services and supplies.

SOURCE: Office of Research, Demonstrations, and Statistics: National health expenditures, 1979, by R.M. Gibson. *Health Care Financing Review*. HCFA Pub. No. 03054. Health Care Financing Administration. Washington. U.S. Government Printing Office, Summer 1980.

Table 82. Consumer Price Index (1967 – 100) and average annual percent change for all items and selected items: United States, selected years 1950-79

(Data are based on reporting by samples of providers and other retail outlets)

Year	Item						
	All items	*Medical care*	*Food*	*Apparel and upkeep*	*Housing*	*Energy*	*Personal care*
				Consumer Price Index			
1950	72.1	53.7	74.5	79.0	72.8	—	68.3
1955	80.2	64.8	81.6	84.1	82.3	—	77.9
1960	88.7	79.1	88.0	89.6	90.2	94.2	90.1
1965	94.5	89.5	94.4	93.7	94.9	96.3	95.2
1970	116.3	120.6	114.9	116.1	118.9	107.0	113.2
1975	161.2	168.6	175.4	142.3	166.8	176.6	150.7
1976	170.5	184.7	180.8	147.6	177.2	189.3	160.5
1977	181.5	202.4	192.2	154.2	189.6	207.3	170.9
1978	195.3	219.4	211.2	159.5	202.6	220.3	182.0
1979	217.7	240.1	234.7	166.4	227.5	277.7	195.5
				Average annual percent change			
1950-55	2.2	3.8	1.8	1.3	2.5	—	2.7
1955-60	2.0	4.1	1.5	1.3	1.9	—	3.0
1960-65	1.3	2.5	1.4	0.9	1.0	0.4	1.1
1965-70	4.2	6.1	4.0	4.4	4.6	2.1	3.5
1970-75	6.7	6.9	8.8	4.2	7.0	10.5	5.9
1975-76	5.8	9.5	3.1	3.7	6.2	7.2	6.5
1976-77	6.5	9.6	6.3	4.5	7.0	9.5	6.5
1977-78	7.6	8.4	9.9	3.4	6.9	6.3	6.5
1978-79	11.5	9.4	11.1	4.3	12.3	26.1	7.4

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor: *Consumer Price Index*. Various releases.

Table 63. Consumer Price Index (1967=100) for all items and medical care components: United States, selected years 1950-79

(Data are based on reporting by samples of providers and other retail outlets)

Item and medical care component	Year							
	1950	1955	1960	1965	1970	1975	1978	1979
	Consumer Price Index							
CPI, all items	72.1	80.2	88.7	94.5	116.3	161.2	195.3	217.7
Less medical care	—	—	89.4	94.9	116.1	160.9	193.9	216.2
CPI, all services	58.7	70.9	83.5	92.2	121.6	166.6	210.8	234.4
All medical care	53.7	64.8	79.1	89.5	120.6	168.6	219.4	240.1
Medical care services	49.2	60.4	74.9	87.3	124.2	179.1	235.3	258.5
Professional services	—	—	—	—	119.7	164.5	209.2	228.5
Physician services	55.2	65.4	77.0	88.3	121.4	169.4	223.3	245.5
Dental services	63.9	73.0	82.1	92.2	119.4	161.9	199.3	217.0
Other professional services[1]	—	—	—	—	—	—	103.3	110.5
Other medical care services	—	—	—	—	129.7	196.9	267.0	295.2
Hospital and other medical services[1]	—	—	—	—	—	—	106.0	116.9
Hospital room	30.3	42.3	57.3	75.9	145.4	236.1	331.6	368.2
Other hospital and medical care services[1]	—	—	—	—	—	—	105.7	115.9
Medical care commodities	88.5	94.7	104.5	100.2	103.6	118.8	143.9	154.7
Prescription drugs	92.6	101.6	115.3	102.0	101.2	109.3	132.1	142.6
Nonprescription drugs and medical supplies[1]	—	—	—	—	—	—	103.9	111.3
Eyeglasses[1]	—	—	—	—	—	—	102.4	108.0
Internal and respiratory over-the-counter drugs	—	—	—	98.0	106.2	130.1	159.1	172.2
Nonprescription medical equipment and supplies[1]	—	—	—	—	—	—	104.0	110.2

[1] Dec. 1977 = 100.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor: *Consumer Price Index*. Various releases.

Table 84. Consumer Price Index (1967 = 100) average annual percent change for all items and medical care components: United States, selected years 1950-79

(Data are based on reporting by samples of providers and other retail outlets)

Item and medical care component	*Period*						
	1950-55	*1955-60*	*1960-65*	*1965-70*	*1970-75*	*1975-78*	*1978-79*
	Average annual percent change						
CPI, all items	2.2	2.0	1.3	4.2	6.7	6.6	11.5
Less medical care	—	—	1.2	4.1	6.7	6.4	11.5
CPI, all services	3.8	3.3	2.0	5.7	6.5	8.2	11.2
All medical care	3.8	4.1	2.5	6.1	6.9	9.2	9.4
Medical care services	4.2	4.4	3.1	7.3	7.6	9.5	9.9
Professional services	—	—	—	—	6.6	8.3	9.2
Physician services	3.4	3.3	2.8	6.6	6.9	9.6	9.9
Dental services	2.7	2.4	2.3	5.3	6.3	7.2	8.9
Other professional services[1]	—	—	—	—	—	—	7.0
Other medical care services	—	—	—	—	8.7	10.7	10.6
Hospital and other medical services[1]	—	—	—	—	—	—	10.3
Hospital room	6.9	6.3	5.8	13.9	10.2	12.0	11.0
Other hospital and medical care services[1]	—	—	—	—	—	—	9.6
Medical care commodities	1.4	2.0	-0.8	0.7	2.8	6.6	7.5
Prescription drugs	1.9	2.6	-2.4	-0.2	1.6	6.5	7.9
Nonprescription drugs and medical supplies[1]	—	—	—	—	—	—	7.1
Eyeglasses[1]	—	—	—	—	—	—	5.5
Internal and respiratory over-the-counter drugs	—	—	—	1.6	4.1	5.9	8.2
Nonprescription medical equipment and supplies[1]	—	—	—	—	—	—	6.0

[1] Dec. 1977 = 100.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor: *Consumer Price Index.* Various releases.

Table 65. National health expenditures, according to source of funds: United States, selected years 1929-79

(Data are compiled by the Health Care Financing Administration)

Year	All health expenditures in billions	Source of funds					
		Private			Public		
		Amount in billions	Amount per capita	Percent of total	Amount in billions	Amount per capita	Percent of total
1929	$ 3.6	$ 3.2	$ 25.49	86.4	$ 0.5	$ 4.00	13.6
1935	2.9	2.4	18.30	80.8	0.6	4.34	19.2
1940	4.0	3.2	23.61	79.7	0.8	6.03	20.3
1950	12.7	9.2	59.62	72.8	3.4	22.24	27.2
1955	17.7	13.2	78.33	74.3	4.6	27.05	25.7
1960	26.9	20.3	110.20	75.3	6.6	36.10	24.7
1965	42.0	31.0	156.84	73.9	11.0	55.48	26.1
1970	74.9	47.1	225.98	62.9	27.8	133.44	37.1
1971	83.1	51.4	244.28	61.9	31.7	150.47	38.1
1972	93.5	58.1	273.44	62.1	35.4	166.90	37.9
1973	103.0	63.7	297.72	61.8	39.4	183.94	38.2
1974	116.3	69.1	320.48	59.5	47.2	218.63	40.6
1975	132.1	75.8	348.63	57.4	56.3	258.95	42.6
1976	148.9	85.7	390.59	57.5	63.2	288.21	42.5
1977	169.9	99.3	448.93	58.4	70.6	319.38	41.6
1978	188.6	108.0	483.88	57.2	80.7	361.64	42.8
1979	212.2	120.8	536.82	56.9	91.4	406.12	43.1

SOURCE: Office of Research, Demonstrations, and Statistics: National health expenditures, 1979, by R.M. Gibson. *Health Care Financing Review*. HCFA Pub. No. 03054. Health Care Financing Administration. Washington. U.S. Government Printing Office, Summer 1980.

Table [illegible]6. National health expenditures average annual percent change, according to source of funds: United States, selected years 1929-79

(Data are compiled by the Health Care Financing Administration)

Period	*All health expenditures*	*Source of funds*	
		Private	*Public*
	Average annual percent change		
1929-79	8.5	7.5	11.0
1929-35	-3.5	-4.7	3.1
1935-40	6.6	5.9	5.9
1940-50	12.2	11.1	15.6
1950-55	6.9	7.5	6.2
1955-60	8.7	9.0	7.5
1960-65	9.3	8.8	10.8
1965-70	12.3	8.7	20.4
1970-75	12.0	10.0	15.2
1970-71	10.9	9.1	14.0
1971-72	12.5	13.0	11.7
1972-73	10.2	9.6	11.3
1973-74	12.9	8.5	19.8
1974-75	13.6	9.7	19.3
1975-76	12.7	13.1	12.3
1976-77	14.1	15.9	11.7
1977-78	11.0	8.8	14.3
1978-79	12.5	11.9	13.3

SOURCE: Office of Research, Demonstrations, and Statistics: National health expenditures, 1979, by R.M. Gibson. *Health Care Financing Review.* HCFA Pub. No. 03054. Health Care Financing Administration. Washington. U.S. Government Printing Office, Summer 1980.

Table 67. Personal health care expenditures and percent distribution, according to source of payment: United States, selected years 1929-79

(Data are compiled by the Health Care Financing Administration)

Year	All personal health care expenditures[1]	Source of payment							
				Third-party payment					
							Government		
		All sources	Direct payment	Total	Private health insurance	Philanthropy and industry	Total	Federal	State and local
		Percent distribution							
1929	$ 3,202	100.0	[2]88.4	11.6	—	2.6	9.0	2.7	6.3
1935	2,663	100.0	[2]82.4	17.6	—	2.8	14.7	3.4	11.3
1940	3,548	100.0	[2]81.3	18.7	—	2.6	16.1	4.1	12.0
1950	10,885	100.0	65.5	34.5	9.1	2.9	22.4	10.4	12.0
1955	15,708	100.0	58.1	41.9	16.1	2.8	23.0	10.5	12.5
1960	23,680	100.0	54.9	45.1	21.1	2.3	21.8	9.3	12.5
1965	36,000	100.0	51.6	48.4	24.2	2.2	21.9	10.5	11.4
1970	65,372	100.0	40.0	60.0	24.1	1.6	34.4	22.3	12.1
1971	71,979	100.0	38.2	61.8	24.6	1.7	35.5	23.3	12.2
1972	80,177	100.0	38.3	61.7	24.2	1.6	35.9	23.7	12.3
1973	88,688	100.0	37.7	62.3	24.7	1.5	36.2	23.8	12.3
1974	101,007	100.0	34.9	65.1	25.5	1.5	38.2	25.6	12.6
1975	116,522	100.0	32.4	67.6	26.7	1.3	39.6	27.1	12.6
1976	131,276	100.0	31.7	68.3	27.8	1.3	39.2	27.6	11.6
1977	147,968	100.0	33.0	67.0	26.2	1.5	39.3	27.8	11.5
1978	166,627	100.0	31.8	68.2	27.0	1.3	39.9	28.0	11.8
1979	188,551	100.0	31.8	68.2	26.7	1.3	40.2	28.3	12.0

[1] Includes all expenditures for health services and supplies other than (a) expenses for prepayment and administration, and (b) government public health activities.

[2] Includes any insurance benefits and expenses for prepayment (insurance premiums less insurance benefits).

SOURCE: Office of Research, Demonstrations, and Statistics: National health expenditures, 1979, by R.M. Gibson. *Health Care Financing Review*. HCFA Pub. No. 03054. Health Care Financing Administration. Washington. U.S. Government Printing Office, Summer 1980.

Table 68. National health expenditures and percent distribution, according to type of expenditure: United States, selected years 1950-79

(Data are compiled by the Health Care Financing Administration)

Type of expenditure	1950	1960	1965	1970	1975	1978	1979
	Amount in billions						
Total	$12.7	$26.9	$42.0	$74.9	$132.1	$188.6	$212.2
	Percent distribution						
All expenditures	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Health services and supplies	92.4	93.6	91.8	92.9	93.7	94.9	95.3
Hospital care	30.4	33.8	33.1	37.1	39.5	40.2	40.2
Physician services	21.7	21.1	20.2	19.1	18.9	19.0	19.1
Dentist services	7.6	7.4	6.7	6.3	6.2	6.3	6.4
Nursing home care	1.5	2.0	4.9	6.3	7.6	8.0	8.4
Other professional services	3.1	3.2	2.5	2.1	2.0	2.2	2.2
Drugs and drug sundries	13.6	13.6	12.4	11.0	8.9	8.2	8.0
Eyeglasses and appliances	3.9	2.9	2.9	2.6	2.3	2.1	2.1
Expenses for prepayment	3.6	4.1	4.1	3.7	3.1	3.8	3.6
Government public health activities	2.9	1.5	1.9	1.9	2.4	2.8	2.9
Other health services	4.2	4.1	3.1	2.7	2.8	2.4	2.4
Research and construction	7.6	6.4	8.2	7.1	6.3	5.1	4.7
Research	0.9	2.5	3.4	2.5	2.5	2.3	2.2
Construction	6.7	3.9	4.8	4.6	3.8	2.8	2.5

SOURCE: Office of Research, Demonstrations, and Statistics: National health expenditures, 1979, by R.M. Gibson. *Health Care Financing Review.* HCFA Pub. No. 03054. Health Care Financing Administration. Washington. U.S. Government Printing Office, Summer 1980.

Table 69. National health expenditures average annual percent change, according to type of expenditure: United States, selected years 1950-79

(Data are compiled by the Health Care Financing Administration)

Type of expenditure	*Period*					
	1950-79	*1950-60*	*1960-65*	*1965-70*	*1970-75*	*1975-79*
	Average annual percent change					
All expenditures	10.2	7.8	9.3	12.3	12.0	12.6
Health services and supplies	10.3	8.0	8.9	12.5	12.2	13.1
Hospital care	11.3	9.0	8.8	14.9	13.4	13.1
Physician services	9.7	7.5	8.3	11.1	11.7	13.0
Dentist services	9.6	7.5	7.3	11.1	11.6	13.4
Nursing home care	17.0	10.9	31.5	17.8	16.6	15.2
Other professional services	8.9	8.1	3.7	9.1	10.4	15.7
Drugs and drug sundries	8.2	7.8	7.3	9.5	7.6	9.5
Eyeglasses and appliances	7.8	4.7	9.3	9.7	9.1	9.9
Expenses for prepayment	10.2	9.1	9.7	10.0	8.2	16.8
Government public health activities	10.2	1.4	14.5	11.8	17.3	17.6
Other health services	8.2	7.7	3.4	9.5	12.4	8.8
Research and construction	8.4	5.9	15.0	9.1	9.3	4.5
Research	13.5	18.9	16.9	5.5	11.4	9.3
Construction	6.5	2.2	13.8	11.4	8.1	1.0

SOURCE: Office of Research, Demonstrations, and Statistics: National health expenditures, 1979, by R.M. Gibson. *Health Care Financing Review*. HCFA Pub. No. 03054. Health Care Financing Administration. Washington. U.S. Government Printing Office, Summer 1980.

Table 70. Hospital expenses per inpatient day, personnel and number per 100 patients, and average annual percent change: United States, 1971-78

(Data are based on reporting by a census of hospitals)

Year and period	Adjusted expenses per inpatient day[1]			Labor costs as percent of total	Personnel[2]	
	Total	Labor[3]	Non-labor		Number in thousands	Number per 100 patients
1971	83.43	53.10	30.33	63.6	1,999	272
1972	94.61	59.24	35.37	62.6	2,056	278
1973	101.78	62.86	38.92	61.8	2,149	280
1974	113.21	68.76	44.45	60.7	2,289	289
1975	133.08	79.00	54.08	59.4	2,399	298
1976	152.24	88.08	64.16	57.9	2,483	304
1977	173.25	99.63	73.62	57.5	2,581	315
1978	193.81	110.82	82.99	57.2	2,662	323
	Average annual percent change					
1971-78	12.8	11.1	15.5	...	4.2	2.5
1971-72	13.4	11.6	16.6	...	2.9	2.2
1972-73	7.6	6.1	10.0	...	4.5	0.7
1973-74	11.2	9.4	14.2	...	6.5	3.2
1974-75	17.6	14.9	21.7	...	4.8	3.1
1975-76	14.4	11.5	18.6	...	3.5	2.0
1976-77	13.8	13.1	14.7	...	3.9	3.6
1977-78	11.9	11.2	12.7	...	3.1	2.5

[1] Refers exclusively to expenses incurred for inpatient care.

[2] Full-time equivalent personnel.

[3] Labor expenses include employee benefits. Previously, these benefits were included under nonlabor expenses. Therefore, data from this table should not be compared with past issues of *Health, United States*.

NOTE: Data refer to non-Federal short-term general and other specialty hospitals.

SOURCE: American Hospital Association: *Hospital Statistics, 1979 Edition*. Chicago, 1979. (Copyright 1979: Used with the permission of the American Hospital Association.)

Table 71. Average annual percent increases in average hospital expenses per patient day, according to contributing factors: United States, selected years 1960-78

(Data are based on a number of government and private sources)

Contributing factor	Period					
	1960-65[1]	1965-68	1968-71	1971-74	1974-76	1976-78
	Average annual percent increase					
Total	6.7	11.2	14.3	10.7	16.0	12.8
Wages and prices	3.5	5.3	8.2	7.1	9.5	8.2
Wage rates	4.8	6.6	10.1	7.0	10.6	8.9
Prices of hospital purchases	1.3	3.4	5.4	7.0	7.8	7.2
Services	3.2	5.9	6.1	3.7	6.5	4.6
Hospital employees	1.7	3.4	3.3	2.0	2.5	3.3
Other expenses[2]	5.8	9.8	10.2	6.6	12.4	6.4
	Percent of total increase					
Wages and prices	52.2	47.3	57.3	65.7	59.4	64.1
Services	47.8	52.7	42.7	34.3	40.6	35.9

[1] Statistics calculated on a per patient day basis; statistics for all other periods are calculated on a per adjusted patient day basis. The latter includes an approximation of equivalent services to outpatients.

[2] Nonlabor expenses such as X-rays, laboratory tests, etc.

NOTE: For 1971-78, employee benefits are included as part of the wage component of total hospital expenses. Previously, they were included in the service component. As these benefits amount to a sizable portion of total hospital expenses (7.4 percent in 1978), this impacts on the distribution among contributing factors to hospital expenses.

SOURCES: American Hospital Association: *Hospital Statistics, 1979 Edition.* Chicago, 1979; Bureau of Labor Statistics, U.S. Department of Labor: *Consumer Price Index.* Various releases.

Table 72. Nursing home average monthly charges and percent distribution of residents, according to primary source of payments and selected facility characteristics: United States, 1973-74 and 1977

(Data are based on a sample of nursing homes)

Facility characteristic	1973-74[1]						1977					
		Primary source of payment						Primary source of payment				
	All residents	Own income	Medicare	Medicaid	Public assis-tance welfare	All other sources	All residents	Own income	Medicare	Medicaid	Public assis-tance welfare	All other sources
	Average monthly charge[2]											
All facilities	$ 479	$491	$754	$503	$381	$225	$689	$690	$1,167	$720	$508	$440
Ownership												
Proprietary	489	525	754	486	373	406	670	686	1,048	677	501	562
Nonprofit and government	456	427	*751	556	397	136	732	698	1,325	825	534	324
Certification[3]												
Skilled nursing facility	566	585	765	567	468	290	880	866	1,136	955	575	606
Skilled nursing and intermediate facility	514	521	719	513	482	396	762	800	1,195	739	623	630
Intermediate facility	376	388	...	375	333	*389	556	567	...	563	479	*456
Not certified	329	377	...	...	330	*89	390	447	...	...	401	*155
Bed size												
Less than 50 beds	397	429	*625	431	296	*128	546	516	*869	663	394	*295
50-99 beds	448	484	*786	449	356	186	643	686	*1,141	634	493	468
100-199 beds	502	523	787	508	414	256	706	721	1,242	691	573	551
200 beds or more	576	506	*689	656	496	307	837	823	*1,179	925	602	370
Geographic region												
Northeast	651	637	*957	718	538	131	918	909	1,369	975	*511	395
North Central	433	449	*738	454	360	252	640	652	*1,160	639	537	524
South	410	452	*615	408	306	278	585	585	*1,096	619	452	342
West	454	487	*672	442	323	*314	653	663	*868	663	564	*499

See footnotes at end of table.

Table 72. Nursing home average monthly charges and percent distribution of residents, according to primary source of payments and selected facility characteristics: United States, 1973-74 and 1977—Continued

(Data are based on a sample of nursing homes)

Facility characteristic	1973-74[1]						1977					
	All residents	Primary source of payment					All residents	Primary source of payment				
		Own income	Medicare	Medicaid	Public assistance welfare	All other sources		Own income	Medicare	Medicaid	Public assistance welfare	All other sources
	Percent distribution of residents											
All facilities	100.0	36.7	1.1	47.9	11.4	3.0	100.0	38.4	2.0	47.8	6.4	5.3
Ownership												
Proprietary	100.0	34.5	1.2	52.0	11.0	1.4	100.0	37.5	1.7	49.6	7.3	3.8
Nonprofit and government	100.0	41.9	0.9	38.4	12.2	6.6	100.0	40.4	2.7	43.8	4.4	8.6
Certification[3]												
Skilled nursing facility	100.0	36.9	2.0	53.6	5.3	2.2	100.0	41.5	4.6	41.4	7.7	4.8
Skilled nursing and intermediate facility	100.0	29.8	1.1	59.7	7.6	1.8	100.0	31.6	2.6	58.3	3.2	4.1
Intermediate facility	100.0	35.8	...	53.1	9.7	1.4	100.0	36.3	...	55.3	5.3	3.1
Not certified	100.0	50.6	...	...	39.3	10.2	100.0	64.2	...	...	19.0	16.7
Bed size												
Less than 50 beds	100.0	41.5	*0.6	37.1	17.5	3.4	100.0	49.6	*1.8	32.7	10.5	5.4
50-99 beds	100.0	37.8	0.9	47.9	10.9	2.5	100.0	39.5	*1.2	46.5	8.1	4.7
100-199 beds	100.0	36.3	1.3	50.8	8.8	2.8	100.0	38.4	2.6	50.4	4.6	4.0
200 beds or more	100.0	30.7	*1.3	51.6	12.3	4.1	100.0	28.6	2.3	55.5	4.6	9.1
Geographic region												
Northeast	100.0	30.6	1.4	53.2	10.5	4.5	100.0	34.6	3.3	53.3	3.8	5.1
North Central	100.0	44.4	0.8	35.6	16.1	3.0	100.0	44.5	1.5	42.1	6.5	5.4
South	100.0	31.0	1.1	55.2	10.3	2.4	100.0	32.2	*1.4	52.5	8.2	5.7
West	100.0	37.9	*1.2	54.6	4.6	1.9	100.0	41.3	2.5	44.7	6.7	4.8

[1] Excludes residents in personal care or domiciliary care homes. Excludes residents who did not live in the nursing home for at least one month.

[2] Includes life-care residents and no-charge residents.

[3] Medicare extended care facilities and Medicaid skilled nursing homes from the 1973-74 survey were considered to be equivalent to Medicare or Medicaid skilled nursing facilities in 1977 for the purposes of this comparison.

SOURCES: National Center for Health Statistics: Charges for care and sources of payment for residents in nursing homes, United States, National Nursing Home Survey, August 1973-April 1974, by E. Hing. *Vital and Health Statistics.* Series 13-No. 32. DHEW Pub. No. (PHS) 78-1783. Public Health Service. Washington. U.S. Government Printing Office, Nov. 1977; The National Nursing Home Survey, 1977 summary for the United States, by J.F. Van Nostrand, A. Zappolo, and E. Hing, et al. *Vital and Health Statistics.* Series 13-No. 43. DHEW Pub. No. (PHS) 79-1794. Public Health Service. Washington. U.S. Government Printing Office, July 1979.

Table 73. Personal health care per capita expenditures, according to age, source of payment, and type of expenditure: United States, selected years 1965-78

(Data are compiled by the Health Care Financing Administration)

Year and type of expenditure	*All ages*			*Under 19 years*			*19-64 years*			*65 years and over*		
	Per capita amount	*Source of payment*		*Per capita amount*	*Source of payment*		*Per capita amount*	*Source of payment*		*Per capita amount*	*Source of payment*	
		Private	*Public*		*Private*	*Public*		*Private*	*Public*		*Private*	*Public*
		Percent of total			*Percent of total*			*Percent of total*			*Percent of total*	
1965												
All expenditures	$188.43	78.9	21.1	$ 83.02	84.5	15.5	$215.58	80.8	19.2	$472.31	70.1	29.9
Hospital care	70.46	61.3	38.7	22.51	64.2	35.8	87.24	64.6	35.4	175.52	50.9	49.1
Physician services	42.85	93.1	6.9	22.27	97.7	2.3	49.21	91.6	8.4	92.50	93.1	6.9
Dentist services	14.20	98.3	1.7	10.04	97.5	2.5	17.85	99.0	1.0	11.30	94.4	5.6
Other professional services	5.22	96.4	3.6	1.76	95.5	4.5	6.41	96.4	3.6	12.99	96.7	3.3
Drugs and drug sundries	29.18	96.6	3.4	18.17	98.9	1.1	31.60	98.0	2.0	61.14	89.7	10.3
Eyeglasses and appliances	9.44	98.3	1.6	3.98	98.7	1.3	12.78	98.2	1.8	13.63	99.2	0.8
Nursing home care	10.48	65.6	34.4	—	—	—	2.42	70.0	30.0	97.19	65.0	35.0
Other health services	6.60	32.9	67.1	4.29	12.4	87.6	8.07	45.5	54.5	7.99	8.6	91.4
1970												
All expenditures	$315.37	65.9	34.1	$137.68	76.1	23.9	$337.27	75.4	24.6	$853.81	38.8	61.2
Hospital care	133.39	47.6	52.4	45.72	58.2	41.8	153.21	60.2	39.8	348.74	11.4	88.6
Physician services	68.81	78.5	21.5	36.39	89.6	10.4	75.90	89.0	11.0	149.80	38.5	61.5
Dentist services	22.80	95.3	4.7	15.80	93.5	6.5	27.88	96.2	3.8	20.42	93.5	6.5
Other professional services	7.70	86.1	13.9	2.43	78.6	21.4	9.05	92.6	7.4	19.23	73.3	26.7
Drugs and drug sundries	40.34	94.2	5.8	25.03	96.4	3.6	42.42	95.6	4.4	85.63	88.0	12.0
Eyeglasses and appliances	10.07	94.9	5.1	4.11	96.1	3.9	13.16	96.9	3.1	15.03	83.9	16.1
Nursing home care	22.44	51.2	48.8	.81	—	100.0	4.18	29.7	70.3	204.87	54.4	45.6
Other health services	9.90	28.8	71.2	7.39	10.3	89.7	11.48	39.9	60.1	10.09	8.9	91.2
1976												
All expenditures	$602.45	60.9	39.1	$232.34	71.1	28.9	$624.31	71.1	28.9	$1,623.88	35.5	64.5
Hospital care	272.69	45.2	54.8	83.92	54.4	45.6	300.75	58.5	41.5	702.80	11.2	88.8
Physician services	126.11	74.5	25.5	59.55	82.9	17.1	135.52	84.7	15.3	280.39	42.2	57.8
Dentist services	46.19	95.2	4.8	30.94	90.4	9.6	55.40	96.7	3.3	43.66	95.5	4.5
Other professional services	14.60	79.5	20.5	4.40	63.1	36.9	16.66	89.7	10.3	34.91	59.9	40.1
Drugs and drug sundries	58.40	91.1	8.9	34.62	93.6	6.4	61.10	93.0	7.0	111.07	83.3	16.7
Eyeglasses and appliances	14.60	91.9	8.1	5.83	95.4	4.6	18.40	95.5	4.5	21.12	72.9	27.3
Nursing home care	52.22	44.6	55.4	.77	—	100.0	16.04	20.6	79.4	404.96	50.0	50.0
Other health services	17.64	25.7	74.3	12.32	10.7	89.3	20.43	34.1	65.9	18.97	6.9	93.1

Table 73. Personal health care per capita expenditures, according to age, source of payment, and type of expenditure: United States, selected years 1965-78—Continued

(Data are compiled by the Health Care Financing Administration)

Year and type of expenditure	All ages			Under 19 years			19-64 years			65 years and over		
	Per capita amount	Source of payment		Per capita amount	Source of payment		Per capita amount	Source of payment		Per capita amount	Source of payment	
		Private	Public		Private	Public		Private	Public		Private	Public
		Percent of total			Percent of total			Percent of total			Percent of total	
1977												
All expenditures	$674.46	61.0	39.0	$258.77	71.5	28.5	$690.76	71.2	28.8	$1,821.14	36.1	63.9
Hospital care	307.13	45.6	54.4	92.84	54.6	45.4	334.95	59.2	40.8	794.72	12.0	88.0
Physician services	141.29	74.1	25.9	67.61	84.4	15.6	148.66	84.5	15.5	320.59	41.8	58.2
Dentist services	52.69	95.7	4.3	35.33	91.4	8.6	62.85	96.9	3.1	49.96	96.1	3.9
Other professional services	16.73	77.3	22.7	4.98	48.9	51.1	18.99	88.5	11.5	39.53	59.0	41.0
Drugs and drug sundries	62.45	91.3	8.7	37.19	94.2	5.8	65.02	93.0	7.0	123.69	84.2	15.8
Eyeglasses and appliances	15.62	91.4	8.6	6.22	95.2	4.8	19.57	95.4	4.6	22.50	69.9	30.1
Nursing home care	60.44	45.5	54.5	.86	3.3	96.7	19.36	20.2	79.8	456.18	51.5	48.5
Other health services	18.11	27.1	72.9	13.72	10.6	89.4	21.36	35.1	64.9	13.96	10.0	90.0
1978												
All expenditures	$752.98	61.3	38.7	$286.07	71.3	28.7	$763.96	71.4	28.6	$2,026.19	36.9	63.2
Hospital care	340.93	46.2	53.8	101.76	54.2	45.8	369.98	59.9	40.1	868.86	12.5	87.5
Physician services	158.08	73.2	26.8	75.06	84.0	16.0	163.56	84.3	15.7	365.70	40.6	59.4
Dentist services	59.64	95.9	4.1	40.01	91.6	8.4	70.75	97.1	2.9	56.76	96.7	3.3
Other professional services	19.17	77.3	22.7	5.73	48.5	51.5	21.58	89.0	11.0	44.74	57.9	42.1
Drugs and drug sundries	67.70	91.4	8.6	40.63	93.9	6.1	70.02	93.1	6.9	132.61	84.4	15.6
Eyeglasses and appliances	17.40	90.8	9.2	6.92	95.4	4.6	21.62	95.2	4.8	24.83	66.9	33.2
Nursing home care	70.64	46.9	53.1	1.00	1.5	98.5	23.67	19.6	80.4	518.14	53.8	46.2
Other health services	19.43	27.1	72.9	14.97	10.9	89.1	22.77	35.0	65.0	14.53	9.9	90.1

SOURCE: Office of Research, Demonstrations, and Statistics: Age differences in health care spending, 1978, by C.R. Fisher. *Health Care Financing Review*. HCFA Pub. No. 03045. Health Care Financing Administration. Washington. U.S. Government Printing Office, Spring 1980.

Table 74. Medicare expenditures and percent distribution for persons 65 years of age and over, according to type of service: United States, selected years 1967-78

(Data are compiled by the Health Care Financing Administration)

Type of service	1967	1970	1976	1977	1978
	Amount in millions				
Total	$4,550	$7,099	$16,313	$19,141	$21,775
	Percent distribution				
All services	100.0	100.0	100.0	100.0	100.0
Hospital care	67.4	70.1	74.1	73.8	72.6
Physician services	25.3	24.2	21.3	21.6	22.8
Nursing home care	6.2	3.7	2.0	1.9	1.7
Other services[1]	1.1	2.0	2.6	2.7	2.9

[1] Other services include home health agencies, home health services, eyeglasses and appliances, and other professional services.

SOURCES: Office of Research and Statistics: *Compendium of National Health Expenditure Data*. DHEW Pub. No. (SSA) 76-11927. Social Security Administration. Washington. U.S. Government Printing Office, Jan. 1976; Office of Research, Demonstrations, and Statistics: Age differences in health care spending, 1978, by C.R. Fisher. *Health Care Financing Review*. HCFA Pub. No. 03045. Health Care Financing Administration. Washington. U.S. Government Printing Office, Spring 1980.

Table 75. Medicaid expenditures[1] and percent distribution, according to type of service: United States, selected years 1967-78

(Data are compiled from State and Federal Government sources)

Type of service	Year				
	1967	1970	1976	1977	1978[2]
	Amount in millions				
Total	$2,827	$5,501	$14,849	$16,657	$18,365
	Percent distribution				
All services	100.0	100.0	100.0	100.0	100.0
Hospital care	39.9	43.3	38.3	38.6	37.3
Physician services	11.0	12.2	11.8	11.3	11.2
Dentist services	4.1	3.3	2.6	2.4	2.4
Other professional services	1.5	1.3	1.9	2.0	2.1
Drugs and drug sundries	7.4	7.9	6.7	6.2	6.1
Nursing home care	32.1	27.5	36.5	37.5	39.5
Other health services[3]	4.0	4.5	2.3	1.9	1.3

[1] Expenditures from Federal, State, and local funds under Medicaid. Includes per capita payments for Part B of Medicare and excludes administrative costs.

[2] Preliminary estimates.

[3] Other services include laboratory and radiological services, home health, and family planning services.

SOURCES: Office of Research and Statistics: *Compendium of National Health Expenditure Data.* DHEW Pub. No. (SSA) 76-11927. Social Security Administration. Washington. U.S. Government Printing Office, Jan. 1976; Office of Research, Demonstrations, and Statistics: National health expenditures, 1978, by R.M. Gibson. *Health Care Financing Review.* HCFA Pub. No. 03002 8-79. Health Care Financing Administration. Washington. U.S. Government Printing Office, Summer 1979.

Table 76. Veterans' medical care expenditures[1] and percent distribution, according to type of expenditure: United States, selected fiscal years 1965-79

(Data are compiled from Veterans Administration sources)

Type of expenditure	*Year*						
	1965	*1970*	*1975*	*1976*	*1977[2]*	*1978[2]*	*1979[2]*
	Amount in millions						
Total	$1,150.1	$1,688.6	$3,328.2	$3,838.8	$4,376.3	$4,809.3	$5,159.5
	Percent distribution						
All expenditures	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Inpatient hospital	81.9	71.3	66.4	65.6	64.8	64.3	64.4
Outpatient care	12.0	14.0	17.8	18.5	18.8	18.9	18.5
VA nursing homes and domiciliaries	2.9	4.3	4.8	4.8	4.8	5.1	5.1
Community nursing homes	0.0	1.2	1.4	1.5	1.7	1.8	1.9
All others[3]	3.2	9.1	9.6	9.7	9.8	10.0	10.1

[1] Medical care expenditures exclude construction, medical administration, and miscellaneous operating expenses.

[2] Data for fiscal year ending September 30; all other data for fiscal year ending June 30.

[3] Includes miscellaneous benefits and services, contract hospitals, education and training for 1969-79, subsidies to State veterans' hospitals, nursing homes, and domiciliaries, and the Civilian Health and Medical Program of the Veterans Administration.

SOURCE: Veterans Administration: Unpublished data from the Budget Office.

Table 77. National funding for health research and development and average annual percent change, according to source of funds: United States, selected years 1960-79

(Data are based on multiple sources)

Year and period	All funding	Source of funds			
		Government			
		Federal	State and local[1]	Industry[2]	Nonprofit organizations
		Amount in millions			
1960	$ 884	$ 448	$ 44	$ 253	$ 139
1969	2,785	1,674	144	754	213
1970	2,846	1,667	169	795	215
1971	3,167	1,877	197	860	233
1972	3,527	2,147	228	925	227
1973	3,735	2,225	245	1,033	232
1974	4,431	2,754	254	1,171	252
1975[1]	4,689	2,833	286	1,306	264
1976[1]	5,086	3,068	312	1,439	267
1977[1]	5,599	3,396	338	1,592	273
1978[1]	6,254	3,811	386	1,775	282
1979[1]	[3]7,047	4,321	[3]415	[3]2,026	[3]285
		Average annual percent change			
1960-79	11.5	12.7	12.5	11.6	3.9
1960-69	13.6	15.8	14.1	12.9	4.9
1969-79	9.7	10.0	11.2	10.4	3.0
1970-71	11.3	12.6	16.6	8.2	8.4
1971-72	11.4	14.4	15.7	7.6	-2.6
1972-73	5.9	3.6	7.5	11.7	2.2
1973-74	18.6	23.8	3.7	13.4	8.6
1974-75	5.8	2.9	12.6	11.5	4.8
1975-76	8.5	8.3	9.1	10.2	1.1
1976-77	10.1	10.7	8.3	10.6	2.2
1977-78	11.7	12.2	14.2	11.5	3.3
1978-79	12.7	13.4	7.6	14.1	1.1

[1] Revised figures.

[2] Includes expenditures for drug research. These expenditures are included in the "drugs and sundries" component of the Social Security Administration's National Health Expenditure Series, not under "research."

[3] Estimates.

SOURCE: Office of Program Planning and Evaluation, National Institutes of Health, Public Health Service: Selected data.

Table 78. Federal obligations for health research and development and percent distribution, according to agency: United States, fiscal years 1970-79

(Data are compiled from Federal Government sources)

Agency	Year									
	1970	1971	1972	1973	1974	1975	1976	1977[1]	1978[1]	1979[1]
	Amount in millions									
Total	$1,666.6	$1,876.6	$2,147.3	$2,225.3	$2,753.6	$2,833.2	$3,061.1	$3,395.9	$3,811.5	$4,321.2
	Percent distribution									
All Federal agencies	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Department of Health, Education, and Welfare	70.6	70.1	73.8	72.3	76.0	77.5	77.6	78.1	79.0	79.9
National Institutes of Health	52.4	55.4	59.2	59.5	63.1	66.4	67.1	67.1	67.7	68.3
Other Public Health Service	16.2	13.2	12.8	11.5	11.4	9.8	9.4	9.1	9.6	9.7
Other Department of Health, Education and Welfare	2.0	1.6	1.7	1.4	1.5	1.3	1.1	1.9	1.8	1.8
Other agencies	29.4	29.9	26.2	27.7	24.0	22.5	22.4	21.9	21.0	20.2
Department of Agriculture	3.0	3.2	3.1	2.7	2.2	2.2	2.0	2.5	2.5	2.6
Department of Defense	7.5	6.6	5.9	5.7	4.3	4.1	3.9	4.4	4.3	4.3
Department of Energy[2]	...	...	...	...	...	...	...	...	5.1	4.4
Department of the Interior	0.7	1.2	1.6	1.5	1.2	0.3	0.4	0.3	0.4	0.5
Department of State	0.6	0.8	0.7	0.7	0.4	0.2	0.3	0.7	0.5	0.5
Department of Transportation	0.6	2.2	1.8	2.9	2.4	0.4	0.2	0.2	0.2	0.1
Atomic Energy Commission[2]	6.3	5.6	4.8	5.0	...	...	...	...	...	...
Consumer Product Safety Commission	...	...	...	...	0.2	0.3	0.2	0.2	0.1	0.1
Energy Research and Development Administration[2]	...	...	...	...	4.4	5.8	5.5	5.3	...	...
Environmental Protection Agency	...	0.7	0.7	0.9	0.7	1.3	2.4	1.7	1.5	1.6
National Aeronautics and Space Administration	5.2	4.0	2.3	1.9	2.9	2.6	2.4	1.4	1.5	1.0
National Science Foundation	1.7	1.8	1.7	2.0	1.7	1.6	1.7	1.6	1.7	1.7
Veterans Administration	3.5	3.3	3.2	3.3	3.1	3.3	3.2	3.2	3.0	3.0
All other departments and agencies	0.3	0.3	0.3	0.9	0.7	0.3	0.3	0.3	0.2	0.2

[1] Data for fiscal year ending September 30; all other data for fiscal year ending June 30.

[2] Data for the Atomic Energy Commission, Energy Research and Development Administration, and Department of Energy form a continuous series.

SOURCE: Office of Program Planning and Evaluation, National Institutes of Health, Public Health Service: Selected data.

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APPENDIX I: Sources and Limitations of Data

Introduction

This report consolidates the most current data on the health of the population of the United States, the availability and use of health resources, and health care expenditures. The information was obtained from the data files and/or published reports of many governmental and nongovernmental agencies and organizations. In each case, the sponsoring agency or organization collected data using its own methods and procedures. Therefore, the data in this report vary considerably with respect to source, method of collection, definitions, and reference period.

In most instances, data referred to in the detailed tables are from the ongoing data collection systems of the National Center for Health Statistics (NCHS). Unless otherwise noted, the Health Status and Determinants, Utilization of Health Resources, and Health Care Resources-Facilities data are based on NCHS data systems. Health Care Resources-Manpower data come primarily from the Bureau of Health Professions, Health Resources Administration, and the American Medical Association. Much of the Health Care Expenditures data was compiled by the Office of Research, Demonstrations, and Statistics, Health Care Financing Administration.

Although a detailed description and comprehensive evaluation of each data source is beyond the scope of this appendix, users should be aware of the general strengths and weaknesses of the different data collection systems. For example, population-based surveys obtain socioeconomic data, data on family characteristics, and information on the impact of an illness, such as days lost from work or limitation of activity. However, they are limited by the amount of information a respondent remembers or is willing to report. Detailed medical information such as precise diagnoses or the types of operations performed may not be known and so will not be reported. Conversely, health care providers, such as physicians and hospitals, usually have good diagnostic information but little or no information about the socioeconomic characteristics of individuals or the impact of an illness on the individual.

The population covered by different data collection systems may not be the same, and understanding the differences is critical to interpreting the data. Data on vital statistics and national expenditures cover the entire population. Most data on morbidity and utilization of health resources cover only the civilian noninstitutionalized population. Thus, statistics are not included for military personnel, who are usually young; for institutionalized people, who may be of any age; or nursing home residents, who are usually old.

All data collection systems are subject to error, and records may be incomplete or contain inaccurate information. People may not remember essential information, a question may not mean the same thing to different respondents, and some institutions or individuals may not respond at all. The sponsoring agencies do the best they can, but it is not always possible to measure the magnitude of these errors or their impact on the data. Where possible, the tables have notes describing the universe and the method of data collection to enable the user to place his or her own evaluation on the data. In many instances, data do not add to totals because of rounding.

Statistics based on samples have sampling errors in addition to those types of errors mentioned above. A sampling error is a measure of the variability introduced because only a sample of the universe was taken. The fact that a sample has an additional source of error does not mean that sample data are less reliable than full-count data. Frequently, the money saved by taking only a sample is spent on reducing other forms of error through more pretesting of survey forms, better quality control, and other measures.

The descriptive summaries that follow provide a general overview of study design, methods of data collection, and reliability and validity of the data. More complete and detailed discussions are found in the publications referenced at the end of each summary. The data set or source is listed under the agency or organization that sponsored the data collection.

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DEPARTMENT OF HEALTH AND HUMAN SERVICES

Public Health Service

OFFICE OF HEALTH RESEARCH, STATISTICS, AND TECHNOLOGY

National Center for Health Statistics

National Vital Registration System

The vital registration system of the National Center for Health Statistics (NCHS) collects and publishes data on births, deaths, marriages, and divorces in the United States. Fetal deaths are classified and tabulated separately from other deaths. The Division of Vital Statistics obtains information on births and deaths from the registration offices of all States, New York City which performs its own data collection, the District of Columbia, Puerto Rico, the U.S. Virgin Islands, and Guam. Geographic coverage for births and deaths has been complete since 1933.

Until 1972, microfilm copies of all death certificates and a 50-percent sample of birth certificates were received from all registration areas and processed by NCHS. Beginning in 1972, some States began sending their data to NCHS through the Cooperative Health Statistics System (CHSS). States that participate in the CHSS program process 100 percent of their death and birth records and send the entire data file to NCHS on computer tape. The number of participating States has grown from 6 in 1972 to 44 in 1979.

The standard certificates of birth, death, and fetal death recommended by NCHS are modified in each registration area to serve the area's needs. However, most certificates conform closely in content and arrangement to the standard certificate, and all certificates contain a minimum data set specified by NCHS.

In most areas, practically all births and deaths are registered. The most recent survey of the completeness of birth registration, conducted on a sample of births from 1964 to 1968, showed that 99.3 percent of all births in the United States during that period were registered. No comparable information is available for deaths, but it is generally believed that death registration in the United States is at least as complete as birth registration. However, there are isolated areas in the United States where underreporting of births and deaths may be severe enough to affect the validity of local statistics.

For more information, see: National Center for Health Statistics, *Vital Statistics of the United States, 1976*, Vol. I, DHHS Pub. No. (PHS) 80-1103 and Vol. II, Part A, DHEW Pub. No. (PHS) 79-1114, Public Health Service, Washington, U.S. Government Printing Office, 1980 and 1979.

National Survey of Family Growth

Data from the National Survey of Family Growth (NSFG) are based on a five-stage area probability sample of civilian noninstitutionalized women living in households in the coterminous United States who are 15-44 years of age and who are currently married, previously married, or never married but have offspring living in the household.

The counties and independent cities of the United States were combined to form a frame of primary sampling units (PSU's), and 101 PSU's were selected as the first-stage sample for Cycle I of NSFG, conducted from June 1973 to February 1974. The next three stages produced a clustered sample of 28,998 households within the 101 PSU's. At 26,028 of these households (89.8 percent), a household screener interview was completed. These screeners produced a fifth-stage sample of 10,879 eligible women, of which 9,797 were interviewed.

Cycle II of NSFG was conducted from January to September 1976. The sample design was basically the same as it was in Cycle I. The sample consisted of 27,162 households in 79 PSU's. Household screener interviews were completed at 25,479 of these households (93.8 percent). Of the 10,202 eligible women in the sample, 8,611 were interviewed.

In order to produce estimates for the entire population of eligible women in the United States, data for the interviewed sample women were inflated by the reciprocal of the probability of selection at each stage of sampling and adjusted for both screener and interview nonresponse. In addition, estimates for ever-married women in 12 age and race categories were poststratified to benchmark population values based on data from the Current Population Survey of the U.S. Bureau of the Census.

Quality control procedures for interviewer selection, interviewer training, field listing, and data processing were built into NSFG to minimize nonsampling error and bias. In addition, the nonresponse adjustments in the estimator were designed to minimize the effect of nonresponse bias by assigning to nonrespondents the characteristics of similar respondents. Sampling errors for NSFG were estimated by balanced half-sample replication.

Discussion of the balanced half-sample technique, summary sampling error charts, and detailed information on the NSFG sample design are available in the following reports: National Center for Health Statistics, National Survey of Family Growth, Cycle I, sample design, estimation procedures, and variance estimation, by D. K. French, *Vital and Health*

Statistics, Series 2-No.76, DHEW Pub. No. (PHS) 78-1350, Public Health Service, Washington, U.S. Government Printing Office, Jan. 1978, and National Center for Health Statistics, National Survey of Family Growth, Cycle II, sample design, estimation procedures, and variance estimation, by W.R. Grady, *Vital and Health Statistics*, Series 2-No. 87, DHHS Pub. No. (PHS) 80-1361, Public Health Service, Washington, U.S. Government Printing Office, to be published.

National Health Interview Survey

The National Health Interview Survey (NHIS) is a continuing nationwide sample survey in which data are collected through personal household interviews. Information is obtained on personal and demographic characteristics, illnesses, injuries, impairments, chronic conditions, utilization of health resources, and other health topics. The household questionnaire is reviewed each year, with supplemental topics being added or deleted. For most topics, data are collected over an entire calendar year. The universe for NHIS is the civilian noninstitutionalized population of the United States. Members of the Armed Forces, U.S. nationals living in foreign countries, and persons who died during the reference period are excluded.

The survey is based on a multistage, probability cluster sample of 376 primary sampling units selected from approximately 1,900 geographically defined units in the first stage, and 12,000 segments containing about 42,000 eligible occupied households in the final stage. The usual NHIS sample is about 111,000 persons in 41,000 interviewed households in a year. The response rate is ordinarily about 96 percent of the eligible households. National estimates are based on a four-stage estimation procedure involving inflation by the reciprocal of the probability of selection, a nonresponse adjustment, ratio adjustment, and poststratification.

For more detailed information on NHIS design, limitations of data, and sampling errors of the estimates, see: National Center for Health Statistics, Current estimates from the National Health Interview Survey, United States, 1978, by J. D. Givens, *Vital and Health Statistics*, Series 10-No. 130, DHEW Pub. No. (PHS) 80-1551, Public Health Service, Washington, U.S. Government Printing Office, Nov. 1979.

National Health Examination Survey

The National Health Examination Survey (NHES) is a continuing nationwide sample survey conducted by the National Center for Health Statistics in which data for determining the health status of the population are collected through direct standardized physical examinations, clinical and laboratory tests, and measurements. The content of the NHES program is revised periodically, and selected components are added or deleted to meet the current needs for health data of this type.

For the first cycle of the National Health Examination Survey (NHES I), 1960-62, data were collected on the total prevalence of certain chronic diseases as well as the distributions of various physical and physiological measures, including blood pressure and serum cholesterol levels. A highly stratified, multistage probability sample of 7,710 adults, of whom 86.5 percent were examined, was selected to represent the 111 million civilian noninstitutionalized adults 18-79 years of age in the United States at that time. The sample areas consisted of 42 primary sampling units (PSU's) from the 1,900 geographic units.

The second and third cycles (NHES II and NHES III) were targeted at children 6-11 years of age and youths 12-17 years of age, respectively. The sample designs for both samples were virtually identical with the same 40 primary sampling units (PSU's) selected from the nearly 1,900 primary sampling units (PSU's) into which the United States had been divided. NHES II, 1963-1965, utilized a highly stratified, multistage probability sample of 7,417 children, of whom 96 percent were examined to represent the 29 million children 6-11 years of age in the civilian noninstitutionalized population of the United States at the midpoint of the survey. In NHES III, 1966-1970, 90 percent of the sample of 7,514 youths were examined, representing the 23 million youths 12-17 years of age in the civilian noninstitutionalized population of the United States at the time of the survey. Because the sample design was the same as that employed in NHES II, nearly one-third of those youths examined in NHES III had also been examined as children in the earlier survey.

The primary emphasis of both Cycle II and Cycle III was on various measurements of growth and development, but screening was also done for heart disease, congenital abnormalities, eye, nose, and throat diseases, and neuromusculoskeletal disorders. Information was obtained from each examinee by means of a household interview; detailed questionnaires for medical and developmental histories; a school questionnaire; medical, dental, and psychological examinations, vision and hearing tests; anthropometric measurements; and certain X-rays and laboratory tests.

In 1971, a nutrition surveillance component was added and the survey name was changed to the National Health and Nutrition Examination Survey.

For further information on NHES I, see: National Center for Health Statistics, Cycle I of the National Health Examination Survey, sample and response, United States, 1960-1962, T. Gordon and H. W. Miller, *Vital and Health Statistics*, PHS Pub. No. 1000-Series 11-No. 1, Public Health Service, Washington, U.S. Government Printing Office, Apr. 1964, and National Center for Health Statistics, Plan and initial program of the Health Examination Survey, *Vital and Health Statistics*, DHEW Pub. No. (HRA) 74-1038, Series 1-No. 4, Health Resources Administration, Washington, U.S. Government Printing Office, July 1965.

For further information on NHES II, see: National Center for Health Statistics, Plan and operation and response results of a program of children's examinations, *Vital and Health Statistics*, PHS Pub. No. 1000-Series 1-No. 5, Public Health Service, Washington, U.S. Government Printing Office, Oct. 1967.

For further information on NHES III, see: National Center for Health Statistics, Plan and operation of a National Health Examination Survey of U.S. youths 12-17 years of age, *Vital and Health Statistics*, DHEW Pub. No. (HRA) 75-1018, Series 1-No. 8, Health Resources Administration, Washington, U.S. Government Printing Office, Sept. 1969.

National Health and Nutrition Examination Survey

This survey collects health-related data that can be obtained only by direct physical examinations, clinical and laboratory tests, and related measurement procedures. In the first National Health and Nutrition Examination Survey (NHANES-I), a major purpose was to measure and monitor indicators of the nutritional status of the American people through dietary intake data, biochemical tests, physical measurements, and clinical assessments for evidence of nutritional deficiency. Detailed examinations were given by dentists, ophthalmologists, and dermatologists with an assessment of need for treatment. In addition, data were obtained for a subsample of adults on overall health care needs and behavior, and more detailed examination data were collected on cardiovascular, respiratory, arthritic, and hearing conditions.

The NHANES-I target population was the civilian noninstitutionalized population 1-74 years of age residing in the coterminous United States, except for people residing on any of the reservation lands set aside for the use of American Indians. The sample design was a multistage, stratified probability sample of clusters of persons in land-based segments. The sample areas consisted of 65 primary sampling units (PSU's) selected from the 1,900 PSU's in the coterminous United States. A subsample of persons 25-74 years of age was selected to receive the more detailed health examination. Groups at high risk of malnutrition were oversampled at known rates throughout the process.

Household interviews were completed for more than 96 percent of the 28,043 persons selected for the NHANES-I sample, and about 75 percent (20,749) were examined between 1971 and 1974.

The estimation procedure used to produce national statistics involved inflation by reciprocals of the probabilities of selection, adjustment for nonresponse, and poststratified ratio adjustment to population totals. Sampling errors also were estimated to measure the reliability of the statistics.

For more information on NHANES-I, see: National Center for Health Statistics, Plan and operation of the National Health and Nutrition Examination Survey, United States, 1971-1973, by H. W. Miller, *Vital and Health Statistics*, Series 1-Nos. 10a and 10b, DHEW Pub. No. (HSM) 73-1310, Health Services and Mental Health Administration, Washington, U.S. Government Printing Office, Feb. 1973.

National Master Facility Inventory

The National Master Facility Inventory (NMFI) is a comprehensive file of inpatient health facilities in the United States. The three broad categories of facilities in NMFI are hospitals, nursing and related care homes, and other custodial or remedial care facilities. To be included in NMFI, hospitals must have at least six inpatient beds, and nursing and related care homes must have at least three inpatient beds.

NMFI is kept current by the periodic addition of names and addresses obtained from State licensing agencies for all newly established inpatient facilities. In addition, annual surveys of hospitals and periodic surveys of nursing homes and other facilities are conducted to update name and location, type of business, number of beds, and number of residents or patients in the facilities.

From 1968 through 1975, the hospital survey was conducted in conjunction with the American Hospital Association (AHA) Annual Survey of Hospitals. AHA performed the data collection for its member hospitals, while NCHS collected the data for the approximately 400 non-AHA registered hospitals. Since 1976, however, all of the data collection has been performed by AHA.

Hospitals are requested to report data for the full year ending September 30. More than half of the responding hospitals used this reporting period for the 1977 Survey. The remaining hospitals used various other reporting periods.

The nursing home and other facilities survey was conducted by the National Center for Health Statistics in 1963, 1967, 1969, 1971, 1973, and 1976. In 1976, data for 16 States were collected at least partially through the Cooperative Health Statistics System (CHSS). There may have been changes in data collection procedures, coverage, definitions, and concepts in preliminary data from these 16 States in 1976.

The response rate for the 1978 hospital survey was about 92 percent. The response rate for the 1976 nursing home and other facilities survey was about 95 percent for the portion of the survey not conducted through CHSS.

Statistics derived from the hospital and nursing home and other facilities surveys were adjusted for both facility and item nonresponse. Missing items on the questionnaire were imputed, when possible, by using information reported by the same facility in a previous survey. When data were not available from a previous census for a responding facility, the data were imputed by using data from similar responding facilities. Similar facilities are defined as those with the same types of business, ownership, service, and approximately the same bed size.

For more detailed information on NMFI, see: National Center for Health Statistics, Design and methodology of the 1967 Master Facility Inventory Survey, by G. G. Hollis, *Vital and Health Statistics*, PHS Pub. No. 1000-Series 1-No. 9, Public Health Service, Washington, U.S. Government Printing Office, Jan. 1971.

National Hospital Discharge Survey

The National Hospital Discharge Survey (NHDS) is a continuing nationwide sample survey of short-stay hospitals in the United States. The scope of NHDS encompasses patients discharged from noninstitutional hospitals, exclusive of military and Veterans Administration hospitals, located in the 50 States and the District of Columbia. Only hospitals having six beds or more for patient use and those in which the average length of stay for all patients is less than 30 days are included in the survey. Although all discharges of patients from these hospitals are within the scope of the survey, discharges of newborn infants from all hospitals and discharges of all patients from Federal hospitals are excluded from this report.

The sample was selected from a frame of about 7,500 short-stay hospitals listed in the National Master Facility Inventory. A two-stage stratified sample design was used, and hospitals were stratified according to bed size and geographic region. The largest hospitals were selected with certainty in the sample, and the probability of selection of a hospital decreased as the bed size of the hospital decreased. Within each sample hospital, a systematic random sample of discharges was selected from the daily listing sheet. The within-hospital sampling ratio for selecting discharges varied inversely with the probability of selection of the hospital, so that the overall probability of selecting a discharge was approximately the same in each bed-size class.

Survey hospitals used an abstract form to transcribe data from the face sheet of hospital records. Forms were completed either by hospital staff or representatives of the National Center for Health Statistics.

The basic unit of estimation for NHDS was the sample patient abstract. The estimation procedure involved inflation by reciprocals of the probabilities of selection, adjustment for nonresponding hospitals and missing abstracts, and ratio adjustments to fixed totals. Of the 535 hospitals selected for the survey, 487 were within the scope of the survey, and 413 participated in the survey in 1978. Data were abstracted from about 219,000 medical records.

For more detailed information on the design of NHDS and the magnitude of sampling errors associated with NHDS estimates, see: National Center for Health Statistics, Utilization of short-stay hospitals, annual summary for the United States, 1978, by B. J. Haupt, *Vital and Health Statistics*, Series 13-No. 46, DHEW Pub. No. (PHS) 80-1797, Public Health Service, Washington, U.S. Government Printing Office, Mar. 1980.

National Nursing Home Survey

Two sample surveys were conducted by the National Center for Health Statistics to obtain information on nursing homes, their expenditures, residents, staff, and, in the most recent survey, discharged patients. The first survey was conducted between August 1973 and April 1974. The most recent National Nursing Home Survey (NNHS) was conducted from May through December 1977.

Data on facilities were collected by personal interviews with administrators; facility accountants completed questionnaires on expenditures. Resident data were collected by a nurse familiar with the care provided to the resident. The nurse relied on the medical record and personal knowledge of the residents. Employees completed a self-administered questionnaire. Discharge data, collected only in the most recent NNHS, were based on information recorded in the medical record.

For the initial survey conducted in 1973-74, the universe included only those nursing homes that provided some level of nursing care. Thus, homes providing only personal or domiciliary care were excluded. The sample of 2,118 homes was selected from the 17,685 homes that provided some level of nursing care and were listed in the 1971 Master Facility Inventory (MFI) or those which opened for business in 1972. Data were obtained from about 20,600 staff and 19,000 residents. Response rates were 97 percent for facilities, 88 percent for expenditures, 98 percent for residents, and 82 percent for staff.

The scope of the 1977 NNHS encompassed all types of nursing homes, including personal care and domiciliary care homes. The sample of about 1,700 facilities was selected from 23,105 nursing homes in the sampling frame, which consisted of all homes listed in the 1973 MFI and those opening for business between 1973 and December 1976. Data were obtained from about 13,600 staff, 7,000 residents, and 5,100 discharged residents. Response rates were 95 percent for facilities, 85 percent for expenses, 81

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percent for staff, 99 percent for residents, and 97 percent for discharges.

Statistics from NNHS were derived by a ratio-estimating procedure. Statistics were adjusted for failure of a home to respond, failure to fill out one of the questionnaires, and failure to complete an item on a questionnaire.

For more information on the 1973-74 NNHS, see: National Center for Health Statistics, Selected operating and financial characteristics of nursing homes, United States, 1973-74 National Nursing Home Survey, by M. R. Meiners, *Vital and Health Statistics*, Series 13-No.22, DHEW Pub. No. (HRA) 76-1773, Health Resources Administration, Washington, U.S. Government Printing Office, Dec. 1975. For more information on the 1977 NNHS, see: National Center for Health Statistics, The National Nursing Home Survey, 1977 summary for the United States, by J.F. Van Nostrand, A. Zappolo, and E. Hing, et al., *Vital and Health Statistics*, Series 13-No. 43, DHEW Pub. No. (PHS) 79-1794, Public Health Service, Washington, U.S. Government Printing Office, July 1979.

National Ambulatory Medical Care Survey

The National Ambulatory Medical Care Survey (NAMCS) is a continuing national probability sample of ambulatory medical encounters. The scope of the survey covers physician-patient encounters in the offices of nonfederally employed physicians classified by the American Medical Association or American Osteopathic Association as "office-based, patient care" physicians. Excluded are visits to hospital-based physicians, visits to specialists in anesthesiology, pathology, and radiology, and visits to physicians who are principally engaged in teaching, research, or administration. Telephone contacts and nonoffice visits are also excluded.

A multistage probability design is employed. The first-stage sample consists of 87 primary sampling units (PSU's) selected from about 1,900 such units into which the United States has been divided. In each sample PSU, a sample of practicing physicians is selected. The final stage involves selection within a randomly assigned 7-day reporting period, and the selection of samples of patient visits during that period.

For the 1978 survey, 3,007 physicians were selected for the sample, of whom 2,541 were found to be eligible for NAMCS and were asked to participate. A total of 1,850 physicians (72.8 percent of those eligible) participated in the study, providing data concerning a random sample of about 47,300 patient visits.

The estimation procedure used in NAMCS basically has three components: (1) inflation by reciprocals of the probabilities of selection, (2) adjustment for nonresponse, and (3) ratio adjustment to fixed totals.

For more detailed information on the design of NAMCS and the magnitude of sampling errors associated with NAMCS estimates, see: National Center for Health Statistics, 1977 summary, National Ambulatory Medical Care Survey, by T. Ezzati and T. McLemore, *Advance Data From Vital and Health Statistics*, No. 48, DHEW Pub. No. (PHS) 79-1250, Public Health Service, Hyattsville, Md., Apr. 13, 1979.

HEALTH RESOURCES ADMINISTRATION

Bureau of Health Professions

Medical Specialist Supply Projections

In an ongoing effort, the Division of Health Professions Analysis, Bureau of Health Professions (formerly the Bureau of Health Manpower), evaluates both the current and future supply of health manpower in the various occupations.

The 1976 detailed supply of active physicians (M.D.'s) by age, sex, specialty, and country of medical education—available on tape from the American Medical Association—was used as the starting point for projections of active physicians published in 1978.

The projections were derived essentially from two distinct estimation matrices. The first matrix produced a "basic" projection of year-by-year future M.D. graduates and separations from the active workforce by country of medical education. Estimates of first-year enrollments, student attrition, other medical school-related trends, and a model of foreign and Canadian medical graduate immigration were used. The second matrix distributed the future graduates and separations by specialty, disaggregated by country of medical education. Projections of first-year residency trends were used, and deaths and retirements of active practitioners were distributed among the specialties proportionate to the supply in each specialty as of 1974. Mortality and retirement losses were computed by 5-year age cohort on an annual basis, using age distributions and mortality and retirement rates from AMA data.

For more information, see: Bureau of Health Manpower, *The Current and Future Supply of Physicians and Physician Specialists*, DHEW Pub. No. (HRA) 79-13, Health Resources Administration, Hyattsville, Md., 1979.

Health Manpower Shortage Areas

Designation of Health Manpower Shortage Areas is an ongoing activity of the Division of Health Professions Analysis, Bureau of Health Professions.

Shortage areas are designated for seven professional categories in connection with three Federal programs: the National Health Service Corps, Loan Repayment Programs, and Scholarship Programs. The designations are also used to determine funding priorities for other programs.

Areas may be considered for shortage area designation by submitting an application with supporting documentation to the Bureau of Health Professions.

Criteria for designation are defined in Department of Health and Human Services regulations. Interim regulations were published in the Code of Federal Regulations (42 CFR Part 5) on Jan. 10, 1978. Final regulations are currently being developed.

For more information, write: Distribution Studies Branch, Division of Health Professions Analysis, Bureau of Health Professions, Health Resources Administration, 3700 East-West Highway, Hyattsville, Md. 20782.

CENTER FOR DISEASE CONTROL

Bureau of Epidemiology

National Morbidity Reporting System

This is a system for collecting demographic, clinical, and laboratory data primarily from State and territorial health agencies to provide national surveillance for conditions such as rabies, aseptic meningitis, diphtheria, tetanus, encephalitis, foodborne outbreaks, and others. Completeness of reporting varies greatly, since not all cases receive medical care and not all treated conditions are reported. Reporting is voluntary.

Estimates of underreporting have been made for two diseases, measles and viral hepatitis. It is generally accepted that about 10-15 percent of all cases of measles that occur in the United States are reported to the Center for Disease Control (CDC). About 15-20 percent of all cases of viral hepatitis are reported to CDC.

Depending on the disease, data are collected weekly or monthly and are analyzed to detect epidemiologic trends or to locate cases requiring control efforts. Data are published weekly and summarized annually. For more information, see: Center for Disease Control, Reported morbidity and mortality in the United States, 1978, *Morbidity and Mortality Weekly Report*, 27(54), Sept. 1979, or write to Center for Disease Control, Chief, Consolidated Surveillance and Communications Activity, Bureau of Epidemiology, Atlanta, Ga. 30333.

Abortion Surveillance

The Center for Disease Control (CDC) acquires abortion service statistics by State of occurrence from two sources—central health agencies and hospitals and facilities. Since the initiation of epidemiologic surveillance of abortion in 8 States in 1969, the number of States from which statewide abortion data are reported increased to 47 in 1978. Most of the 45 central health agencies have established direct reporting systems, although a few collected data by surveying abortion facilities. Inquiries by CDC to hospitals and facilities provided information for 4 States that did not collect statewide abortion data.

The total number of abortions reported to CDC is about 18 percent less than the total estimated independently by the Alan Guttmacher Institute, the research and development division of the Planned Parenthood Federation of America, Inc.

For more information, see: Center for Disease Control, *Abortion Surveillance, 1978*, Public Health Service, DHEW, Atlanta, Ga., to be published, or write to Center for Disease Control, Director, Family Planning Evaluation Division, Bureau of Epidemiology, Atlanta, Ga. 30333.

Bureau of State Services

Venereal Disease Control Division

All States require that each case of syphilis and gonorrhea that receives medical attention be reported to the State or local health officer. Chancroid, granuloma inguinale, and lymphogranuloma venereum are also reportable in most States. Every 3 months, each State submits to the Public Health Service a statistical summary of cases reported during the quarter. All cases not previously reported in the State, regardless of duration of infection or previous treatment status, are counted in the statistical report of cases. Reported morbidity, as reported cases are sometimes called, indicates the result of case-detection activities.

The trend of rates of reported cases of early syphilis over a period of years may indicate incidence trends if no significant changes have occurred in casefinding efforts or completeness of case reporting. Similarly, the trend of reported cases of syphilis in all stages of disease can indicate prevalence trends, subject to the same limitations. Therefore, trends in reported cases and rates must be interpreted with caution since they reflect not only changes in disease incidence and prevalence but also changes in casefinding efforts and completeness of case reporting.

Cases of primary and secondary syphilis are reportable by law in all 50 States and the District of Columbia, but the reported cases understate actual incidence because: (1) cases occur which are not diagnosed in the primary or secondary stages, and (2) many diagnosed cases are not reported to the health departments. The Venereal Disease Control Division estimates that the actual incidence of primary and secondary syphilis was about 80,000 to 85,000 cases in 1979, of which 24,874 were reported to

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health departments. A total of 67,049 cases of syphilis (all stages) were reported in 1979.

In general, gonorrhea is underreported for the same reasons as syphilis. But gonorrhea is undetected much more frequently for women than for men because most infected women exhibit no evidence of infection. The Venereal Disease Control Division estimates that 1.6-2.0 million cases of gonorrhea occurred in the United States in 1979, of which 1,003,958 were reported to health departments.

Data are published annually in *STD Fact Sheet* (formerly VD Fact Sheet). For more information, see: Center for Disease Control, *STD Fact Sheet, 1979*, 35th ed., DHHS Pub. No. (CDC) 80-8195, Public Health Service, Atlanta, Ga., or write to Center for Disease Control, Bureau of State Services, Technical Information Services, Atlanta, Ga. 30333.

U.S. Immunization Survey

This system is the result of a contractual agreement between the Center for Disease Control and the U.S. Bureau of the Census. Estimates from the Immunization Survey are based on data obtained during the third week of each September for a subsample of households interviewed for the Current Population Survey, which is described separately in this appendix.

The reporting system contains demographic variables and vaccine history along with disease history when relevant to vaccine history. The system is used to estimate the immunization level of the Nation's child population against the vaccine preventable diseases; from time to time, immunization level data on the adult population are collected.

The scope of the U.S. Immunization Survey covers the 50 States and the District of Columbia. In the 1978 sample, approximately 41,000 household units were included in the survey sample. Six thousand sample units were found to be vacant or otherwise not to be interviewed. Of the approximately 35,000 occupied households eligible for interview, about 1,500 were not interviewed because the occupants either were not at home after repeated calls or were unavailable for some other reason.

The estimating procedure that was used involves the inflation of weighted sample results to independent estimates of the civilian noninstitutionalized population of the United States by age and race.

For more information, see: Center for Disease Control, *United States Immunization Survey, 1978*, DHEW Pub. No. (CDC) 79-8221, Public Health Service, Atlanta, Ga., July 1979.

ALCOHOL, DRUG ABUSE, AND MENTAL HEALTH ADMINISTRATION

National Institute of Mental Health

Surveys of Mental Health Facilities

The Survey and Reports Branch of the Division of Biometry and Epidemiology conducts several surveys of mental health facilities. Some of the data in this report are derived from more than one of these surveys. The response rate to most of the items on these surveys is relatively high (90 percent or better) as is the rate for data presented in this report. However, for some survey items, the response rate may be somewhat lower.

The Inventories of Mental Health Facilities are the primary source for NIMH data used in this report. This data system is based on questionnaires mailed by January of each year to mental health facilities in the United States, including psychiatric hospitals, non-Federal general hospitals with psychiatric services, residential treatment centers for emotionally disturbed children, federally funded community mental health centers, freestanding outpatient psychiatric clinics, and other types of multiservice or day-night facilities.

Other surveys conducted by the Survey and Reports Branch encompass sample surveys of patients coming under care in State, county, and private mental hospitals, outpatient psychiatric services, and general hospital inpatient psychiatric units. The purpose of these surveys is to determine the characteristics of patients served by these facilities.

For more information, write: Survey and Reports Branch, Division of Biometry and Epidemiology, National Institute of Mental Health, 5600 Fishers Lane, Rockville, Md. 20857.

HEALTH CARE FINANCING ADMINISTRATION

Office of Research, Demonstrations, and Statistics

Estimates of National Health Expenditures

Estimates of public and private expenditures for health are compiled annually by type of expenditure and source of funds. The data for several Federal health programs are taken from the Office of Management and Budget's special analysis of health programs, while data for the remaining Federal health programs are supplied directly by the various agencies.

Estimates for non-Federal expenditures come from an array of sources. American Hospital Association data on hospital finances, increased slightly to allow for osteopathic hospitals, are the primary source for estimates relating to hospital care. Estimated expenditures for the services of dentists and physicians in private practice are based on the gross income from self-employed practice reported to the Internal Revenue Service. The salaries of dentists and physicians on the staffs of hospitals and hospital outpatient facilities are considered a component of hospital care. Expenditures for the education and training of medical personnel are considered to be expenditures for education, and where they can be separated, they are excluded from health expenditures. Expenditures for drugs, drug sundries, eye glasses, and appliances exclude those provided to inpatients and are estimated principally from the report of personal consumption expenditures in the U.S. Department of Commerce's national income accounts in the *Survey of Current Business.* Nursing home care expenditures by both public and private sources are based on data from the National Nursing Home Survey conducted by the National Center for Health Statistics. Data on the expenditures of private health insurance organizations come from a data series compiled by the Health Care Financing Administration. Expenditures for construction represent "value put in place" for hospitals, nursing homes, medical clinics, and medical research facilities but not for private office buildings providing office space for private practitioners.

Some of the national health expenditures estimates have been revised back to 1965 to reflect changes in basic data sources, their interpretation, and improvements in methodology. For more specific information on items included and excluded and on general methodology used, see: Gibson, R.M., National health expenditures, 1979, *Health Care Financing Review*, Vol. 2, No. 1, Summer 1980.

DEPARTMENT OF COMMERCE

Bureau of the Census

U.S. Census of Population

The census of population has been taken in the United States every 10 years since 1790. In the 1970 census, basic demographic data such as sex, race, age, and marital status were obtained from 100 percent of the enumerated population. In addition, information such as educational attainment, occupational status, and earnings were obtained from a 20-percent sample. More detailed data such as previous residence, veteran status, place of work, and country of birth of parents, were collected from a 15-percent sample; a 5-percent sample was asked about disability status, citizenship, length of marriage, vocational training, and the like. Americans living overseas received a supplemental schedule.

Detailed national data are tabulated and published, as are data for areas as small as census tracts.

For information on undercoverage, see: U.S. Bureau of the Census, *Estimates of Coverage of the Population by Sex, Race, and Age, Demographic Analysis*, PHC(E)-4; for tables of sampling errors for sampled data, see: *Census of Population 1970*, PC(1)-C, General Social and Economic Characteristics, Appendix C.

Current Population Survey

The Current Population Survey (CPS) is a household sample survey of the civilian noninstitutionalized population conducted monthly by the U.S. Bureau of the Census to provide estimates of employment, unemployment, and other characteristics of the general labor force, the population as a whole, and various other subgroups of the population.

A list of housing units from the 1970 census, supplemented by newly constructed units and households known to be missed in the 1970 census, provides the sampling frame in most areas for the present CPS. In some rural locations, current household listings of selected land areas serve as the frame.

The present CPS sample is located in 461 areas comprising 923 counties and independent cities with coverage in every State and the District of Columbia. In an average month during 1975, the number of housing units or living quarters designated for the national sample was about 58,000, of which about 3,000 were found to be nonexistent, demolished, or no longer used as living quarters. Of the remaining 55,000 units assigned for interview, about 45,000 were interviewed households, 2,000 were households at which the members were not available for interview, and 8,000 were found to be vacant, occupied by persons with usual residence elsewhere, or otherwise not eligible for interview.

The estimation procedure used involves inflation by reciprocals of the probabilities of selection, adjustment for nonresponse, and ratio adjustment.

For more information, see: U.S. Bureau of the Census, *The Current Population Survey, Design and Methodology*, Technical Paper 40, Washington, U.S. Government Printing Office, Jan. 1978.

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Population Estimates and Projections

National estimates are derived by use of decennial census data as benchmarks and of data available from various agencies as follows: births and deaths (Public Health Service); immigrants (Immigration and Naturalization Service); the Armed Forces (Department of Defense); net movement between Puerto Rico and the U.S. mainland (Puerto Rico Planning Board); and Federal employees abroad (Office of Personnel Management and Department of Defense). State estimates are based on similar data and also on a variety of data series, including school statistics from State departments of education and parochial school systems.

National population projections indicate the approximate future level and characteristics of the population under given assumptions as to future fertility, mortality, and net immigration. The method used to develop the projections involved preparation of projections of each of the components of population change—births, deaths, and net immigration—and the combination of these with July 1 estimates of the current population. Projections for States and metropolitan areas incorporate further assumptions about population redistribution through interarea migration.

Current estimates and projections are generally consistent with official decennial census figures and do not reflect the amount of estimated decennial census underenumeration.

For more information, see: U.S. Bureau of the Census, Projections of the population of the United States, 1977 to 2050, *Current Population Reports*, Series P-25, No. 704, Washington, U.S. Government Printing Office, 1977.

DEPARTMENT OF LABOR

Bureau of Labor Statistics

Consumer Price Index

The Consumer Price Index (CPI) is a monthly measure of price change for a fixed "market basket" of goods and services. It is revised periodically to take into account changes in what Americans buy and in the way they live. The latest revision introduced (1) a new CPI for all urban consumers, (2) a revision of the CPI for urban wage earners and clerical workers, and (3) a modification of some categories within the medical care component. The new indexes were introduced with the release of January 1978 data.

In this report, all CPI data shown are for urban wage earners and clerical workers. Prices for 400 items were obtained in urban portions of 39 major statistical areas and 17 smaller cities that were chosen to represent all urban places in the United States. They were collected from about 18,000 establishments—grocery and department stores, hospitals, filling stations, and other types of stores and service establishments.

Prices of food, fuels, and a few other items were obtained every month in all 56 locations. Prices of most other commodities and services were collected every month in the five largest areas and every 3 months in other areas. Prices of most goods and services were obtained by personal visits of the Bureau's trained representatives. Mail questionnaires were used to obtain local transit fares, public utility rates, newspaper prices, fuel prices, and certain other items.

In calculating the index, price changes for the various items in each location were averaged together with weights that represent their importance in the spending of all wage earners and clerical workers. Local data were then combined to obtain a U.S. city average. Separate indexes were also published for 23 areas.

The index measures price changes from a designated reference date—1967— which equals 100. An increase of 22 percent, for example, is shown as 122. This change can also be expressed in dollars as follows: The price of a base period "market basket" of goods and services bought by urban wage earners and clerical workers has risen from $10 in 1967 to $12.20.

For more information, see: Bureau of Labor Statistics, *Consumer Price Index, Concepts and Content over the Years*, BLS Report 517, Washington, U.S. Government Printing Office, May 1978.

Employment and Earnings

The Division of Industry Employment Statistics and the Division of Employment and Unemployment Analysis of the Bureau of Labor Statistics (BLS) publish data on employment and earnings. The data are collected by the Bureau of the Census, State Employment Security Agencies, and State Departments of Labor in cooperation with BLS.

The major data source is the Current Population Survey (CPS), a household interview survey conducted monthly by the Bureau of the Census to collect labor force data for BLS. CPS is described separately in this appendix.

Data based on establishment records are also compiled each month from mail questionnaires by BLS, in cooperation with State agencies.

For more information, see: U.S. Department of Labor, Bureau of Labor Statistics, *Employment and Earnings, January 1980*, Vol. 27, No. 1, Washington, U.S. Government Printing Office, Jan. 1980.

ENVIRONMENTAL PROTECTION AGENCY

National Aerometric Surveillance Network

The Environmental Protection Agency (EPA), through extensive monitoring of activities conducted by Federal, State, and local air pollution control agencies, collects data on the five pollutants for which National Ambient Air Quality Standards have been set. These pollution control agencies submit data quarterly to EPA's National Aerometric Data Bank (NADB). There are about 3,400 total stations reporting. Data from some short-term or sporadic monitoring for such purposes as special studies and complaint investigations are usually not included in NADB because the data are not extensive enough to provide equitable comparisons with routine data from permanent monitoring sites.

For more information, see: Environmental Protection Agency, *National Air Pollutant Emission Estimates, 1970-78*, EPA 450/4-80-002, Research Triangle Park, N.C., Jan. 1980, or write to Office of Air Quality Planning and Standards, Environmental Protection Agency, Research Triangle Park, N.C. 27711.

UNITED NATIONS

Demographic Yearbook

The Statistical Office of the United Nations prepares the *Demographic Yearbook*, a comprehensive collection of international demographic statistics.

Questionnaires are sent annually and monthly to more than 220 national statistical services and other appropriate government offices. Data forwarded on these questionnaires are supplemented, to the extent possible, by data taken from official national publications and by correspondence with the national statistical services. To ensure comparability, rates, ratios, and percentages have been calculated in the Statistical Office of the United Nations.

Lack of international comparability between estimates arises from differences in concepts, definitions, and time of data collection. The comparability of population data is affected by several factors, including (1) the definitions of the total population, (2) the definitions used to classify the population into its urban and rural components, (3) difficulties relating to age reporting, (4) the extent of over- or under-enumeration, and (5) the quality of population estimates. The completeness and accuracy of vital statistics data also vary from one country to another. Differences in statistical definitions of vital events may also influence comparability.

For more information, see: United Nations, *Demographic Yearbook 1977*, Pub. No. ST/ESA/STAT/SER.R/6, United Nations, New York, 1977.

World Health Organization

World Health Statistics Annual

The World Health Organization (WHO) is one of the specialized agencies of the United Nations. WHO publishes the *World Health Statistics Annual* each year. This publication is the result of a joint effort by the national health and statistical administrations of many countries, the Statistical Office of the United Nations, and the World Health Organization. It is published in three volumes: Volume I -Vital Statistics and Causes of Death; Volume II - Infectious Diseases, Cases and Deaths; Volume III - Health Personnel and Hospital Establishments.

Data in the *World Health Statistics Annual* are provided by national administrators in answer to questionnaires, or they are obtained from annual national publications. Some of the data are reprinted from the *Demographic Yearbook*.

In many cases, complete comparability of data between countries is not possible. Differences in the definition of a hospital may occur. The level of general education and professional training of health personnel may vary from country to country. Completeness of coverage also varies. Noncomparability of diagnostic coding of data can also occur.

For more information, see: World Health Organization, *World Health Statistics Annual, 1979*, Vols. I, II, III, World Health Organization, Geneva, 1979.

ALAN GUTTMACHER INSTITUTE

Abortion Survey

The Alan Guttmacher Institute (AGI) conducts an annual survey of abortion providers. Data are collected from hospitals, nonhospital clinics, and physicians identified as providers of abortion services. A survey universe of 3,092 hospitals, nonhospital clinics, and individual physicians was compiled. To assess the completeness of the provider and abortion counts, supplemental surveys were conducted of a sample of obstetrician-gynecologists and a sample of hospitals (not in original universe) that were identified as providing abortion services through the American Hospital Association Survey.

The number of abortions estimated by AGI is about 22 percent more than the number reported to the Center for Disease Control.

For more information, write to: The Alan Guttmacher Institute, 515 Madison Avenue, New York, N.Y. 10022.

AMERICAN HOSPITAL ASSOCIATION

Annual Survey of Hospitals

Data from this survey are based on questionnaires that are sent to all hospitals in the United States and its associated areas accepted for registration by the American Hospital Association (AHA). In 1978, questionnaires were mailed to 7,086 registered hospitals. Of these, 7,015 hospitals were located in the 50 States and the District of Columbia, and 71 were located in the U.S. possessions. Overall, 6,351 hospitals reported data—a response rate of 89.6 percent. For nonreporting hospitals and for the survey questionnaires of reporting hospitals on which some information was missing, estimates were made for all data except those on bassinets and facilities. The estimates of the missing data were based on data furnished by reporting hospitals that were similar in terms of bed-size category, type of control, major type of service provided, and type of stay in the hospitals for which data were not reported.

Hospitals are requested to report data for the full year ending September 30. More than half of the responding hospitals used this reporting period in the 1978 survey. The remaining hospitals used various reporting periods.

For more information on the AHA Annual Survey of Hospitals, see: American Hospital Association, *Hospital Statistics, 1979 Edition, Data from the American Hospital Association 1978 Annual Survey*, Chicago, 1979.

AMERICAN MEDICAL ASSOCIATION

Physician Masterfile

A masterfile of physicians has been maintained by the American Medical Association (AMA) since 1906. Today, the Physician Masterfile contains data on almost every physician in the United States, both members and nonmembers of AMA, and on those graduates of American medical schools temporarily practicing overseas. The file also includes graduates of foreign medical schools who are in the United States.

A file is initiated on each individual upon entry into medical school or, in the case of foreign graduates, upon entry into the United States. A census of physicians is conducted every 3 years to update the file information on professional activities, specialization, and present employment status. The last census from which data are available was conducted in 1977. Between censuses, AMA keeps the file current by continuous checks of professional publications and State licensure notices for changes in any physician's activities. When a change is noted, the physician is sent another copy of the questionnaire. In 1976, approximately 3,600 of these questionnaires were mailed per week. The general response rate to the questionnaires is about 87 percent.

For more information on the AMA Physician Masterfile, see: Department of Statistical Analysis, *Physician Distribution and Medical Licensure in the U.S., 1978*, American Medical Association, Chicago, 1980.

Annual Census of Hospitals

From 1920 to 1953, the Council on Medical Education and Hospitals of the American Medical Association (AMA) conducted annual censuses of all hospitals registered by AMA.

In each annual census, questionnaires were sent to hospitals asking for the number of beds, bassinets, births, patients admitted, average census of patients, lists of staff doctors and interns, and other information of importance at that particular time. Response rates were always nearly 100 percent.

The community hospital data from 1940 and 1950 presented in this report were calculated using published figures from the AMA Annual Census of Hospitals. Although the hospital classification scheme used by AMA in published reports is not strictly comparable with the definition of community hospitals, methods were employed to achieve the greatest comparability possible.

For more information on the AMA Annual Census of Hospitals, see: American Medical Association, Hospital service in the United States, *Journal of the American Medical Association*, Vol. 11, No. 116, 1940.

Appendix II

Glossary of Terms

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APPENDIX II: Glossary of Terms

General Terms

Social and Demographic Terms

Age.—Age is reported as age at last birthday, i.e., age in completed years, often calculated by subtracting date of birth from the reference date, with the reference date being the date of the examination, interview, or other contact with an individual.

Age adjustment of death rates.—Age adjustment, using the direct method, is the application of the age-specific death rates in a population of interest to a standardized age distribution in order to eliminate the differences in observed rates that result from age differences in population composition. This is usually done when comparing two or more populations at one point in time, or one population at two or more points in time.

In this report, the mortality rates are age adjusted to the U.S. population enumerated in 1940. Adjustment is based on 11 age intervals as follows: under 1, 1-4, 5-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, and 85 years and over. The data from the National Health Interview Survey, National Ambulatory Medical Care Survey, and the National Hospital Discharge Survey are age adjusted to the 1970 civilian noninstitutionalized population. In these cases, adjustment is based on four age intervals; for National Health Interview Survey, under 17, 17-44, 45-64, and 65 years and over; for National Ambulatory Medical Care Survey and National Hospital Discharge Survey, under 15, 15-44, 45-64, and 65 years and over.

Average annual rate of change (percent change).—In this report, average annual rates of change or growth rates are calculated as follows:

$$N \frac{P_n}{P_o} - 1 \times 100$$

where P_n = later time period

P_o = earlier time period

and N = number of years in interval.

This geometric rate of change assumes that a variable increases or decreases at the same rate during each year between the two time periods.

Color and race.—The Federal Government's data systems often classify individuals into two color groups ("white" and "all other") or three racial groups ("white," "black," and "other races"). Generally, the "other races" group includes American Indian, Chinese, Japanese, and others, while "white" includes Mexican and Cuban. Beginning in 1976, Federal data collections specify ethnic origin, including Spanish heritage.

Depending on the data source, the classification by color and race may be based on self-classification or on observation by an interviewer or other persons filling out the questionnaire. In the national vital registration system, newborn infants are assigned the race of their parents; if the parents are of different races and one is white, the child is assigned the other parent's race; if either parent is Hawaiian, the child is classifed as Hawaiian; in all other cases, the child is assigned the father's race. Prior to 1964, the national vital registration system classified all births for which race was unknown as "white." The National Health Interview Survey assigns to the race of the father children whose parents are of different races. In the National Survey of Family Growth, race is the race of the respondent as classified by interviewer observation.

Family income.—For purposes of the National Health Interview Survey and National Health and Nutrition Examination Survey, all people within a household related to each other by blood, marriage, or adoption constitute a family. Each member of a family is classified according to the total income of the family of which he is a member. Unrelated individuals are classified according to their own income. Family income, then, is the total income received by the members of a family (or by an unrelated individual) in the 12 months prior to interview, including wages, salaries, rents from property, interest, dividends, profits, and fees from their own business, pensions, and help from relatives.

Hispanic origin.—In the National Survey of Family Growth, the respondent is classified as being of Hispanic origin if she reports her origin or descent as Mexican, Chicano, Mexican American, Puerto Rican, Cuban, or other Spanish, regardless of whether she also mentions any other origin.

In tables where data are presented for women according to race and Hispanic origin, women of Hispanic origin are also included in the statistics for white and black women according to how they were identified by interviewer observation.

Marital status.—The population is classified through self-reporting into the categories married and unmarried. Married includes all married people and those separated from their spouses. In the National Survey of Family Growth, married also includes the "informally married" but excludes those separated, other than temporarily absent spouses. Ever-married includes those who are currently married, widowed, divorced, or separated. Unmarried includes those who are single (never married), divorced, or widowed. However, the Abortion Surveillance reports of the Center for Disease Control classify separated people as unmarried for all States except Rhode Island.

Population.—The U.S. Bureau of the Census collects and publishes data on several different types of population in the United States. Various statistical systems then use the appropriate population in calculating rates.

> *Total population* is the population of the United States, including all members of the Armed Forces living in foreign countries, Puerto Rico, Guam, and the U.S. Virgin Islands. Other Americans abroad (e.g., civilian Federal employees and dependents of members of the Armed Forces or other Federal employees) are not included.
>
> *Resident population* is the population living in the United States. This includes members of the Armed Forces stationed in the United States and their families as well as foreigners working or studying here; it excludes foreign military, naval, and diplomatic personnel and their families located here and residing in embassies or similar quarters as well as Americans living abroad. The resident population is often the denominator when calculating birth and death rates and incidence of disease.
>
> *Civilian population* is the resident population excluding members of the Armed Forces. Families of members of the Armed Forces are included, however.
>
> *Civilian noninstitutionalized population* is the civilian population not residing in institutions. Institutions include correctional institutions, detention homes, and training schools for juvenile delinquents; homes for the aged and dependent (e.g., nursing homes and convalescent homes); homes for dependent and neglected children; homes and schools for the mentally or physically handicapped; homes for unwed mothers; psychiatric, tuberculosis, and chronic disease hospitals and residential treatment centers. This population is the denominator in rates calculated for the National Center for Health Statistics' Health Interview Survey, Health and Nutrition Examination Survey, Hospital Discharge Survey, and National Ambulatory Medical Care Survey.

Poverty level.—As used in the National Survey of Family Growth, poverty level is calculated by dividing the total family income by the weighted average threshold income of nonfarm families with the head under 65 years of age based on the poverty levels shown in U.S. Bureau of the Census *Current Population Reports*, Series P-60, No. 106, Money income in 1975 of families and persons in the United States, table A-3 (for Cycle II), and No. 98, Characteristics of the low-income population, 1973, table A-3 (for Cycle I). This definition takes into account the sex of the family head and the number of persons in the family. Total family income includes income from all sources for all members of the respondent's family.

Geographic Terms

Division and region.—The 50 States and the District of Columbia are grouped for statistical purposes by the U.S. Bureau of the Census into nine divisions within four regions. The groupings are as follows:

NORTHEAST

- New England
  - Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut
- Middle Atlantic
  - New York, New Jersey, Pennsylvania

NORTH CENTRAL

- East North Central
  - Michigan, Wisconsin, Ohio, Indiana, Illinois
- West North Central
  - Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas

SOUTH

- South Atlantic
  - Delaware, Maryland, District of Columbia, Virginia, West Virginia,
  - North Carolina, South Carolina, Georgia, Florida
- East South Central
  - Kentucky, Tennessee, Alabama, Mississippi
- West South Central
  - Arkansas, Louisiana, Oklahoma, Texas

WEST

Mountain
Montana, Idaho, Wyoming, Colorado,
New Mexico, Arizona, Utah, Nevada

Pacific
Washington, Oregon, California, Alaska, Hawaii

Level of urbanization.—Counties are classified in a Department of Agriculture system. Metropolitan counties are classified according to the size of the metropolitan area of which they are a part. Nonmetropolitan counties are classified by their number of urban residents and proximity to a metropolitan area. The county classifications are as follows:

I. *Within SMSA.*—Metropolitan counties (see definition under "Standard metropolitan statistical area.").
  1. *Large SMSA* refers to a county within an SMSA of at least 1 million population.
    A. *Core* refers to counties containing the primary central city of an SMSA.
    B. *Fringe* refers to suburban counties of an SMSA.
  2. *Medium SMSA* refers to a county within an SMSA of 250,000 to 999,999 population.
  3. *Other SMSA* refers to a county within an SMSA of less than 250,000 population.

II. *Outside SMSA.*—Nonmetropolitan counties.
  1. *Adjacent to SMSA* refers to a county contiguous to an SMSA.
    A. *Urbanized* refers to a county contiguous to an SMSA and having an aggregate urban population of at least 20,000.
    B. *Less urbanized* refers to a county contiguous to an SMSA and having an aggregate urban population of 2,500 to 19,999.
    C. *Thinly populated* refers to a county contiguous to an SMSA and having no urban population.
  2. *Not adjacent* to SMSA refers to a county not contiguous to an SMSA.
    A. *Urbanized* refers to a county not contiguous to an SMSA and having an aggregate urban population of at least 20,000.
    B. *Less urbanized* refers to a county not contiguous to an SMSA and having an aggregate urban population of 2,500 to 19,999.
    C. *Thinly populated* refers to a county not contiguous to an SMSA and having no urban population.

Metropolitan.—Any county within a standard metropolitan statistical area is metropolitan. Other counties are *nonmetropolitan.*

Registration area.—The United States has separate registration areas for birth, death, marriage, and divorce statistics, which collect data annually from States whose registration data are at least 90 percent complete.

The *death registration area* was established in 1900 with 10 States and the District of Columbia, while the *birth registration area* was established in 1915, also with 10 States and the District of Columbia. Both areas have covered the entire United States since 1933. Currently, Puerto Rico, the U.S. Virgin Islands, and Guam are also included, although in statistical tabulations they are not part of the "United States" total.

Reporting area.—In the national vital registration system, reporting requirements on birth certificates vary according to State. Thus, different numbers of States report various characteristics. For example, births to unmarried women are reported on the birth certificate only in 39 States and the District of Columbia, and the month during which prenatal care began is reported in 49 States and the District of Columbia.

Standard metropolitan statistical area (SMSA).—This is a concept developed for use in statistical reporting and analysis. Except in the New England States, an SMSA is a county or a group of contiguous counties containing at least one city of 50,000 inhabitants or more or "twin cities" with a combined population of at least 50,000. In addition, contiguous counties are included in an SMSA if they are essentially metropolitan in character (based on criteria of labor force characteristics and population density) and are socially and economically integrated with the central city or cities.

In New England, towns and cities rather than counties are the geographic components of the SMSA. Since National Center for Health Statistics (NCHS) data are not coded to identify all towns, NCHS uses the metropolitan State economic area (MSEA), which is made up of county units, for reporting data in New England.

Health Status and Determinants

Fertility

Abortion.—The Center for Disease Control's surveillance program counts *legal abortions* only. What constitutes a legal abortion varies, depending on a State's regulations about when one may be performed.

Birth rate.—This measure divides the number of live births in a population in a given period by the resident population at the middle of that period. The rate may be restricted to births to women of specific age, race, marital status, or geographic location, or it may be related to the entire population.

Gestation.—For both the national vital registration system and the Center for Disease Control's Abortion Surveillance, the period of gestation is defined as beginning with the first day of the last normal menstrual period and ending with the day of birth.

Live birth.—In the World Health Organization's definition, also adopted by the United Nations and the National Center for Health Statistics, a live birth is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life such as heartbeat, umbilical cord pulsation, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached. Each product of such a birth is considered live born.

Live-birth order.—In the national vital registration system, this item from the birth certificate indicates the number of live births a woman has had, counting the birth being recorded.

Mortality

Cause of death.—For the purpose of national mortality statistics, every death is attributed to one underlying condition, based on information reported on the death certificate, and utilizing the international rules for selecting the underlying cause of death from the reported condition. For data years 1968-78, the *Eighth Revision International Classification of Diseases, Adapted for Use in the United States* is being used for coding. Earlier data used the then current revision of the *International Classification of Diseases.* For 1979, the *Ninth Revision* is being used.

Death rate.—This measure divides the number of deaths in a population in a given period by the resident population at the middle of that period. It may be restricted to deaths in specific age, race, sex, or geographic groups, or it may be related to the entire population.

Eighth Revision International Classification of Diseases, Adapted for Use in the United States (ICDA).—ICDA and the *International Classification of Diseases* (ICD), upon which ICDA is based, classify morbidity and mortality information for statistical purposes. Both are arranged in 17 main sections. Most of the diseases are arranged according to their principal anatomical site, with special sections for infective and parasitic diseases; neoplasms; endocrine, metabolic, and nutritional diseases; mental diseases; complications of pregnancy and childbirth; certain diseases peculiar to the perinatal period; and ill-defined conditions. Separate sections provide a classification of injuries according to the external cause giving rise to the injury, usually used for cause-of-death categories, and a classification according to the nature of injury (such as puncture, open wound, or burn), usually used for morbidity categories. Supplementary sections in ICDA on special conditions and examinations without sickness (ICDA codes Y00-Y13) and on surgical operations and diagnostic and other therapeutic procedures are used for coding information on ambulatory and inpatient utilization.

ICD was first used in 1900 and has been revised about every 10 years since then. The *Ninth Revision,* introduced in 1977, is being used to code U.S. mortality data beginning with 1979. A modification of the *Ninth Revision* is being prepared for use with U.S. morbidity data.

Infant mortality.—Infant mortality is the death of live-born children who have not reached their first birthday and is usually expressed as a rate (i.e., the number of infant deaths during a year per 1,000 live births reported in the year).

Life expectancy.—Life expectancy is the average number of years of life remaining to a person at a particular age and is based on a given set of age-specific death rates, generally the mortality conditions existing in the period mentioned. Life expectancy may be determined by race, sex, or other characteristics using age-specific death rates for the population with that characteristic.

Determinants and Measures of Health

Condition.—A health condition is a departure from a state of physical or mental well-being. Conditions, except impairments, are coded according to the *Eighth Revision International Classification of Diseases, Adapted for Use in the United States* (ICDA).

Based on duration, there are two categories of conditions, acute and chronic. In the National Health Interview Survey, *an acute condition* is a condition which has lasted less than 3 months and has involved either a physician visit (medical attention) or restricted activity. The category includes respiratory conditions (ICDA codes 460-486, 501, 508-516, 519, 783), injuries (ICDA codes N800-N870, N872-N884, N890-N894, N900-N994, N996-N999), infective and parasitic conditions (ICDA codes 000-136), and digestive conditions (ICDA codes 520.6-521.5, 521.7-523.9, 525-530, 535-543, 560-561, 564-577, 784-785). In the National Health Interview Survey, a *chronic condition* is any condition lasting 3 months or more or is one of certain conditions classified as chronic regardless of their time of onset. The National Nursing Home Survey uses a specific list of conditions classified as chronic, also disregarding time of onset.

Disability.—Disability is any temporary or long-term reduction of a person's activity as a result of an acute or chronic condition. It is often measured in terms of the number of days that a person's activity has been reduced.

Disability day.—The National Health Interview Survey identifies several types of days on which a person's usual activity is reduced because of illness or injury (reported for the 2-week period preceding the week of the interview). These short-term disability days are not mutually exclusive categories but are defined as follows:

A *restricted-activity day* is any day on which a person cuts down on his or her usual activities for all or most of that day because of an illness or an injury. Restricted-activity days are unduplicated counts of bed-disability, work-loss, and school-loss days as well as other days during which a person cuts down on his or her usual activities.

A *bed-disability day* is a day on which a person stays in bed for more than half of the daylight hours (or normal waking hours) because of a specific illness or injury. All *hospital days* are bed-disability days. Bed-disability days may also be work-loss or school-loss days.

A *work-loss day* is a day on which a person did not work at his or her job or business for at least half of his or her normal workday because of a specific illness or injury. The number of work-loss days is determined only for currently employed persons.

A *school-loss day* is a day on which a child did not attend school for at least half of his or her normal schoolday because of a specific illness or injury. School-loss days are determined only for children 6-16 years of age.

Former smoker.—Any person who has smoked at least 100 cigarettes during his or her entire life but who reports smoking no cigarettes at the present time is a former smoker.

Incidence.—Incidence is the number of cases of disease having their onset during a prescribed period of time and is often expressed as a rate (e.g., the incidence of measles per 1,000 children 5-15 years of age during a year). Incidence is a measure of morbidity or other events that occur within a specified period of time.

Limitation of activity.—Each person identified by the National Health Interview Survey as having a chronic condition is classified according to the extent to which his or her activities are limited because of the condition as follows:

(1) Persons unable to carry on major activity.
(2) Persons limited in the amount or kind of major activity performed.
(3) Persons not limited in major activity but otherwise limited.
(4) Persons not limited in activity.

Major activity (or *usual activity*) is the principal activity of a person or of his or her age-sex group. For 1-5 years of age, it refers to ordinary play with other children; for 6-16 years of age, it refers to school attendance; for 17 years of age and over it usually refers to a job, housework, or school attendance.

Notifiable disease.—A notifiable disease is one that health providers are required, usually by law, to report to Federal, State, or local public health officials when diagnosed. Notifiable diseases are those of public interest by reason of their contagiousness, severity, or frequency.

Particulate matter.—Particulate matter is defined as particles of solid or liquid matter in the air, including both nontoxic materials (soot, dust, and dirt) and toxic materials (lead, asbestos, suspended sulfates and nitrates, and the like).

Pollutant.—A pollutant is any substance that renders the atmosphere or water foul or noxious to health.

Prevalence.—Prevalence is the number of cases of a disease, infected persons, or persons with some other attribute present during a particular interval of time. It is often expressed as a rate (e.g., the prevalence of diabetes per 1,000 persons during a year).

Self-assessment of health.—In the National Health Interview Survey, the respondents are asked to evaluate the health of everyone in their household compared with other people of the same age.

Utilization and Resources

Ambulatory Care

Dental visit.—The National Health Interview Survey counts visits to a dentist's office for treatment or advice, including services by a technician or hygienist acting under the dentist's supervision, as dental visits. Services provided to hospital inpatients are not included.

Disposition of visit.—As used by the National Ambulatory Medical Care Survey, this term describes the variety of followup procedures that a physician may plan for the patient, ranging from no followup to specific return contacts, to referral to other providers of care.

Eighth Revision International Classification of Diseases, Adapted for Use in the United States.—See definition under "Mortality" in Health Status and Determinants section.

Office.—In the National Health Interview Survey, an office refers to the office of any physician in private practice, including physicians connected with prepaid group practices. In the National Ambulatory Medical Care Survey, an office is any location for a physician's ambulatory practice other than hospitals, nursing homes, other extended care facilities, patients' homes, and industrial clinics. However, private offices in hospitals are included.

Physician visit.—The National Health Interview Survey counts as a physician visit a visit in person or by telephone to a doctor of medicine or doctor of osteopathy for the purpose of examination, diagnosis, treatment, or advice. The service may be provided directly by the physician or by a nurse or other person acting under the physician's supervision. Contacts involving services provided on a mass basis are not included, nor are contacts for hospital inpatients.

Physician visits are generally classified by the type of place of visit. In the National Health Interview Survey, this includes the *office, hospital outpatient clinic* or *emergency room, telephone* (advice given by a physician in a telephone call), *company or industrial clinic* (units at a place of business that provide treatment through a physician or trained nurse), *home* (any place in which a person was staying at the time a physician was called there), as well as other places.

In the National Ambulatory Medical Care Survey, an *office visit* is any direct personal exchange between an ambulatory patient and a physician, or members of his or her staff, for the purposes of seeking care and rendering health services.

Principal diagnosis.—In the National Ambulatory Medical Care Survey, this is the physician's diagnosis of the patient's most important problem or complaint as evaluated at the time of the visit.

Seriousness of problem.—In the National Ambulatory Medical Care Survey, the physician indicates for each patient visit the seriousness of the problem, condition, or symptom which the patient says caused the visit. Seriousness refers to the physician's clinical judgment as to the extent the patient would be impaired if no care were given. It is expressed as very serious, serious, slightly serious, or not serious.

Inpatient Care

Average daily census or average daily patients.—This refers to the average number of inpatients receiving care each day during a reporting period, excluding newborns.

Average length of stay.—In the National Hospital Discharge Survey, the average length of stay is the total number of patient days accumulated at the time of discharge, counting the date of admission but not the date of discharge, by patients discharged during a reporting period, divided by the number of patients discharged.

As measured in the National Nursing Home Survey, *length of stay for residents* is the time from their admission until the reporting time, while the *length of stay for discharges* is the time between the date of admission and the date of discharge.

Bed.—Any bed that is set up and staffed for use for inpatients is counted as a bed in a facility. In the National Master Facility Inventory, the count is of beds at the end of the reporting period; for the American Hospital Association, it is of the average number of beds during the entire period. The World Health Organization defines a hospital bed as one regularly maintained and staffed for the accommodation and full-time care of a succession of inpatients and situated in a part of the hospital where continuous medical care for inpatients is provided.

Day.—According to the American Hospital Association and National Master Facility Inventory, days or *inpatient days* are the number of adult and pediatric days of care rendered during a reporting period. Days of care for newborns are excluded.

In the National Health Interview Survey, *hospital days during the year* refer to the total number of hospital days occurring in the 12-month period prior to the interview week. A *hospital day* is a night spent in the hospital for persons admitted as inpatients to a hospital.

In the National Hospital Discharge Survey, *days of care* refer to the total number of patient days accumulated by patients at the time of discharge from non-Federal short-stay hospitals during a reporting period. All days from and including the date of admission to but not including the date of discharge are counted. A *patient* is a person who is formally admitted to the inpatient service of the hospital for observation, care, diagnosis, or treatment.

Discharge.—The National Health Interview Survey defines a *hospital discharge* as the completion of any continuous period of stay of 1 night or more in a hospital as an inpatient, excepting the period of stay of a well newborn infant.

According to the National Hospital Discharge Survey, American Hospital Association, and National Master Facility Inventory, this is the formal release of an inpatient by a hospital, i.e., the termination of a period of hospitalization (including stays of 0 nights) by death or by disposition to a place of residence, nursing home, or another hospital. In this report, newborn infants are excluded.

In the National Nursing Home Survey, this is the formal release of a resident by a nursing home.

First-listed diagnosis.—In the National Hospital Discharge Survey, this is the diagnosis listed first on the face sheet of the medical record.

Hospital.—According to the American Hospital Association (AHA) and National Master Facility Inventory (NMFI), hospitals are institutions licensed as hospitals whose primary function is to provide diagnostic and therapeutic patient services for medical conditions and which have at least six beds, an organized physician staff, and continuous nursing services under the supervision of registered nurses. AHA data differ slightly from those of NMFI, since data from NMFI reflect osteopathic hospitals as well as hospitals not registered with AHA. Non-AHA hospitals comprise 5-10 percent of all hospitals in the country. The World Health Organization considers an establishment a hospital if it is permanently staffed by at least one physician, can offer inpatient accommodation, and can provide active medical and nursing care.

Hospitals may be classified by type of service, ownership, and length of stay.

General hospitals provide both diagnostic and treatment services for patients with a variety of medical conditions, both surgical and nonsurgical. According to the World Health Organization, these are hospitals that provide medical and nursing care for more than one category of medical discipline (e.g., general medicine, specialized medicine, general surgery, specialized surgery, obstetrics, etc.); excluded are hospitals, usually ones in rural areas, that provide a more limited range of care. *Psychiatric hospitals* are ones whose major type of service is psychiatric care. See also definition under "Psychiatric Care" section.

Specialty hospitals provide a particular type of service, such as psychiatric, tuberculosis, chronic disease, rehabilitation, maternity, and alcoholic or narcotic, to the majority of their patients.

Federal hospitals are operated by the Federal Government.

Non-Federal government hospitals are operated by State or local governments.

Voluntary nonprofit hospitals are operated by a church or other nonprofit organization.

Proprietary hospitals are operated by individuals, partnerships, or corporations for profit.

Short-stay hospitals in the National Hospital Discharge Survey are those in which the average length of stay is less than 30 days. The American Hospital Association and National Master Facility Inventory define *short-term hospitals* as hospitals in which more than half the patients are admitted to units with an average length of stay of less than 30 days and *long-term hospitals* as ones in which more than half the patients are admitted to units with an average length of stay of 30 days or more. The National Health Interview Survey defines *short-stay hospitals* as any hospital or hospital department in which the type of service provided is general; maternity; eye, ear, nose, and throat; children's; or osteopathic.

Nursing care.—Nursing care is the provision of any of the following services: application of dressings or bandages; bowel and bladder retraining; catheterization; enema; full bed bath; hypodermic, intramuscular, or intravenous injection; irrigation; nasal feeding; oxygen therapy; and temperature-pulse-respiration or blood pressure measurement.

Nursing home.—The minimum standards and regulations for nursing homes vary among the States so that no uniform definition is possible. However, the National Master Facility Inventory includes in its count only facilities licensed by the States in which they are located. The homes are then classified according to the level of care they provide, as follows:

Nursing care homes must employ one or more full-time registered or licensed practical nurses and must provide nursing care to at least half the residents.

Personal care homes with nursing have some but fewer than half the residents receiving nursing care. In addition, such homes must employ one or more registered or licensed practical nurses or must provide administration of medications and treatments in accordance with physician's order, supervision of self-administered medications, or three or more personal services.

Personal care homes without nursing have no residents receiving nursing care. These homes provide administration of medications and treatments in accordance with physician's order, supervision of self-administered medications, or three or more personal services.

Domiciliary care homes primarily provide domiciliary care, but they also provide one or two personal services.

In the 1977 National Nursing Home Survey, all four categories of homes were included. In the 1973-74 survey, only nursing homes providing some level of nursing care were classified as nursing homes.

Skilled nursing facilities provide the most intensive nursing care available outside of a hospital. Facilities certified by Medicare provide posthospital care to eligible Medicare enrollees. Facilities certified by Medicaid as skilled nursing facilities provide skilled nursing services on a daily basis to individuals eligible for Medicaid benefits.

Intermediate care facilities are certified by the Medicaid program to provide health-related services on a regular basis, to Medicaid eligibles who do not require hospital or skilled nursing facility care, but do require institutional care above the level of room and board.

Occupancy rate.—The National Master Facility Inventory and American Hospital Association define *hospital occupancy rate* as the average daily census divided by the number of hospital beds during a reporting period. The *occupancy rate for other facilities* is calculated as the number of residents reported at the time of the interview divided by the number of beds reported.

Outpatient visit.—According to the American Hospital Association, these are visits by patients not lodged in the hospital for medical, dental, or other services. See also definition under "Ambulatory Care" section.

Primary diagnosis.—In the National Nursing Home Survey, this is the primary condition at the last examination as extracted from the resident's medical record.

Resident.—In the National Nursing Home Survey, a resident is a person who has been formally admitted to but not discharged from an establishment.

Psychiatric Care[1]

Addition.—An individual is classified as an addition to a psychiatric facility by being a new admission, a readmission, or a return from leave to either an inpatient or an outpatient psychiatric facility.

Mental disorder.—A mental disorder is any of several disorders listed in Section V of the *Eighth Revision International Classification of Diseases, Adapted for Use in the United States* (ICDA).

Mental health facility.—A mental health facility is an administratively distinct public or private agency or institution whose primary concern is the provision of direct mental health services to the mentally ill or emotionally disturbed. Facilities include public and private psychiatric hospitals, psychiatric units of general hospitals, residential treatment centers (for emotionally disturbed children), federally funded community mental health centers, freestanding outpatient psychiatric clinics, multiservice mental health facilities, and halfway houses.

Psychiatric hospitals are hospitals primarily concerned with providing inpatient care and treatment for the mentally ill. *Psychiatric inpatient units of Veterans Administration general hospitals* and *Veterans Administration neuropsychiatric hospitals* are often combined into the category *Veterans Administration psychiatric hospitals* because of their similarity in size, operation, and length of stay. Other psychiatric hospitals include State and county mental hospitals and private mental hospitals.

General hospitals providing psychiatric services are hospitals that knowingly and routinely admit patients to a separate psychiatric unit for the purpose of diagnosing and treating psychiatric illness.

Residential treatment centers (for emotionally disturbed children) are residential institutions primarily serving emotionally disturbed children and providing treatment services, usually under the supervision of a psychiatrist.

Federally funded community mental health centers are legal entities through which comprehensive mental health services are provided to a delineated catchment area. This mental health delivery system may be implemented by a single facility (with or without subunits) or by a group of affiliated facilities that make available at least the following essential mental health services: inpatient, day treatment, outpatient, emergency care, and community consultation and education.

Freestanding outpatient psychiatric clinics are administratively distinct facilities, whose primary purpose is to provide nonresidential mental health service, and where a psychiatrist assumes medical responsibility for all patients and/or directs the mental health program.

Service mode.—Service mode and *treatment modality* refer generally to the kinds of mental health service available such as inpatient care, outpatient care, day treatment, and the like.

Inpatient care is the provision of mental health treatment to people requiring 24-hour supervision.

Outpatient care is the provision of mental health treatment on an outpatient basis and does not involve any overnight stay in an inpatient facility.

Day treatment is the provision of a planned therapeutic program during most or all of the day for people needing broader programs than are possible through outpatient visits but who do not require full-time hospitalization.

Manpower

Full-time equivalent employee (FTE).—The American Hospital Association and National Master Facility Inventory use an estimate of full-time equivalent employees that counts two part-time employees as one full-time employee, a *full-time employee* being someone working 35 hours a week or more. The National Nursing Home Survey uses an estimate of full-time employees that counts 35 hours of part-time employees' work per week as equivalent to one full-time employee.

Group practice.—Group practice is the application of services by three or more physicians formally organized to provide medical care, consultation, diagnosis, and/or treatment through the joint use of equipment and personnel and with the income from medical practice distributed in accordance with methods previously determined by members of the group.

Nurse practitioner.—These are specially trained nurses who perform acts of diagnosis, treatment, or prescription that traditionally have been within the exclusive province of the physician. Nurse practitioners function under the supervision of physicians for these medical tasks, but not for their nursing practice.

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[1] The definitions for psychiatric care are those used by the National Institute of Mental Health.

Physician.—Physicians are licensed doctors of medicine or osteopathy classified by the American Medical Association and others through self-reporting, as follows:

> *Active physicians* or *professionally active physicians* are ones currently practicing, regardless of the number of hours worked per week.
>
> *Federal physicians* are employed by the Federal Government; *non-Federal* or *civilian physicians* are not.
>
> *Licensed physicians* are authorized to practice in a State. Every State (and the District of Columbia) requires that physicians and dentists be licensed there in order to practice in that State.
>
> *Office-based physicians* are physicians who spend the plurality of their time working in practices based in private offices; *hospital-based physicians* spend the plurality of their time as salaried physicians in hospitals.
>
> *Private practice physicians* are independent of any external policy control and are self-employed or salaried by a partnership. See also definition under "Professional manpower."

Physician assistant.—These are individuals with appropriate medical training who are authorized to perform medical services under the supervision of a licensed physician. The extent to which these medical services may be delegated to the physician assistant by the physician varies from State to State.

Physician specialty.—A physician specialty is any specific branch of medicine that a physician may concentrate in. The specialty classification used by the Bureau of Health Professions and National Ambulatory Medical Care Survey (NAMCS) follows the American Medical Association categories:

> *Primary care specialties* include general practice (or family practice), internal medicine, and pediatrics.
>
> *Medical specialties* include, along with internal medicine and pediatrics, the areas of allergy, cardiovascular disease, dermatology, gastroenterology, pediatric allergy and cardiology, and pulmonary diseases.
>
> *Surgical specialties* include general surgery, neurological surgery, obstetrics and gynecology, ophthalmology, orthopedic surgery, otolaryngology, plastic surgery, colon and rectal surgery, thoracic surgery, and urology. *Other specialties* covered by NAMCS are geriatrics, neurology, preventive medicine, psychiatry, and public health. Other specialties covered by the Bureau of Health Professions are aerospace medicine, anesthesiology, child psychiatry, neurology, occupational medicine, pathology, physical medicine and rehabilitation, psychiatry, public health, and radiology.

Place of employment.—The classification of people employed in the health service industry by place of employment is a U.S. Bureau of the Census adaptation of the U.S. Office of Management and Budget's *Standard Industrial Classification Manual, 1967* which classified people according to health service industry codes 801-809.

Professional manpower.—Professional manpower includes chiropractors, dentists, dental hygienists, licensed practical nurses, pharmacists, physical therapists, physicians, podiatrists, and registered nurses as well as other occupations not covered in this report.

In the United States, counts of these professionals include only those licensed in the State where they practice, with licensure usually requiring the completion of an appropriate degree or certificate program for that profession. In international counts prepared by the World Health Organization, only those professionals active in their profession are counted.

Professionals may be classified according to specialty, place of practice, or other criteria. See definitions under "Physician."

Health Expenditures

Consumer Price Index (CPI).—The CPI is prepared by the U.S. Bureau of Labor Statistics. It is a measure of the changes in average prices of the goods and services purchased by urban wage earners and by clerical workers and their families. The medical care component of the CPI shows trends in medical care prices based on specific indicators of hospital, medical, dental, and drug prices.

A recent revision of the CPI has been in use since January 1978, and changes are noted where applicable in this report.

Economic Stabilization Program (ESP).—This Federal program was established to control wages and prices. On August 15, 1971, all wages and prices were frozen for a period of 90 days, and a system of wage and price controls, administered through a cost-of-living council, was implemented. Controls continued, with periodic changes in the flexibility and intensity with which they were enforced, until their legislative authority expired in April 1974.

Gross national product (GNP).—This is the most comprehensive measure of a nation's total output of goods and services. In the United States, the GNP represents the dollar value in current prices of all goods and services produced for sale plus the estimated value of certain imputed outputs (i.e., goods and services that are neither bought nor sold). The

GNP is the sum of (1) consumption expenditures by both individuals and nonprofit organizations, plus certain imputed values; (2) business investment in equipment, inventories, and new construction; (3) Federal, State, and local government purchases of goods and services; and (4) the sale of goods and services abroad minus purchases from abroad.

Health insurance plans.—Health insurance plans are formal plans with defined membership and benefits, designed to pay all or part of the hospital, physician, or other medical expenses of the insured individual. The different types of plans include prepaid group plans.

> *Prepaid group plans* involve physician group practices that provide a comprehensive range of health care services to an enrolled population for a fixed prepaid capitation payment. *Health Maintenance Organizations* are public or private organizations that provide a comprehensive range of health care services, either directly or under arrangement with others, to an enrolled population for a fixed prepaid capitation payment; prepaid group practice plans are one form of Health Maintenance Organization.

Medicaid (Title XIX).—This program is federally aided but State operated and administered. It provides medical benefits for certain low-income persons in need of medical care. The program, authorized in 1965 by Title XIX of the Social Security Act, categorically covers participants in the Aid to Families with Dependent Children program as well as some participants in the Supplemental Security Income program and other people deemed medically needy in a participating State. States also determine the benefits covered, rates of payment for providers, and methods of administering the program.

Medicare (Title XVIII).—This is a nationwide health insurance program providing health insurance protection to people 65 years of age and over, people eligible for social security disability payments for more than 2 years, and people with end-stage renal disease, regardless of income. The program was enacted July 30, 1965, as Title XVIII, *Health Insurance for the Aged*, of the Social Security Act, and became effective on July 1, 1966. It consists of two separate but coordinated programs: hospital insurance (Part A) and supplementary medical insurance (Part B).

National health expenditures.—This measure estimates the amount spent for all health services and supplies and health-related research and construction activities consumed in the United States during a specified time period. Detailed estimates are available by source of expenditure (e.g., consumer out-of-pocket, private health insurance, and government programs) and by type of expenditure (e.g., hospitals, physicians, and drugs). Data are compiled from a variety of sources that collect data from the providers of care.

> *Health services and supplies expenditures* are outlays for goods and services relating directly to patient care plus expenses for administering health insurance programs and for government public health activities. This category is equivalent to total national health expenditures minus expenditures for research and construction.
>
> *Private expenditures* are outlays for services provided or paid for by nongovernmental sources—consumers, insurance companies, private industry, and philanthropic organizations.
>
> *Public expenditures* are outlays for services provided or paid for by Federal, State, and local government agencies or expenditures required by governmental action (such as workmen's compensation insurance payments).

Personal health care expenditures.—These are outlays for goods and services relating directly to patient care. The expenditures in this category are total national health expenditures minus expenditures for research and construction, expenses for administering health insurance programs, and government public health activities.

GUIDE TO TABLES

(The numbers refer to table numbers in this volume. All tables in this volume contain time trends. The Guide to Tables in *Health, United States, 1979* refers only to that volume. However, the Guide to Tables in *Health, United States, 1978* contains a cumulative guide for the first three reports, *Health, United States, 1975, 1976-77,* and *1978).*

I. HEALTH STATUS AND DETERMINANTS	*Age*	*Sex*	*Color or race*	*Family income*	*Location of residence*	*Other variables*	*Geographic area*		
							Region	*Division, State*	*Inter-national*
Fertility									
General	1-3		1-3			2, 3			
Teenagers	4		4						
Abortion	5		5			5, 6			
Contraception	7		7			7			
Mortality									
General	8	8	8			14			
Infant			10, 11					11	12
Fetal, perinatal			10						12
Life expectancy	9	9, 13	9						13
Heart disease	15	15	15			14			
Ischemic heart disease	16	16	16						
Cancer	17	17	17			14			
Respiratory cancer	18	18	18			14			
Other causes of death						14			
Determinants and measures of health									
Prenatal care			20						
Breastfeeding	21		21	21		21			
Immunization	22								
Cigarette smoking	27-29	27-29	27, 28			29			
Air pollution						30			
Self-assessment of health	24	24	24	24	24		24		
Limitation of activity	24	24	24	24	24		24		
Disability days	26								
Restricted-activity days	25	25	25	25	25		25		
Bed-disability days	25	25	25	25	25		25		
Acute conditions	26								
Diseases, notifiable						23			
Birthweight, low			19					19	

GUIDE TO TABLES—Continued

II. UTILIZATION OF HEALTH RESOURCES	*Age*	*Sex*	*Color or race*	*Family income*	*Location of residence*	*Other variables*	*Geographic region*
Ambulatory							
All physician visits							
Source or place	31	31	31	31	31		31
Interval since last visit	32	32	32	32	32		32
Physician's office							
Principal diagnosis	33	33					
Visit characteristics	35	35	35		35		
Physician's specialty	34	34	34				
Dentist visits, interval since last visit	36	36	36	36	36		36
Inpatient Care							
Short-stay hospitals							
Discharges, general	39, 40	40	40	40	40	37, 39	40
Surgery	39, 41	41				39	
Diagnosis	38	38					
Days of care, general	39, 40	40	40	40	40	37, 39	40
Surgery	39					39	
Diagnosis	38	38					
Mental health facilities additions						44	
Nursing homes							
Residents	42, 43	43	43			42	

III. HEALTH CARE RESOURCES	Occupation or place of employment	Specialty	Type of practice	Other variables	Geographic area	
					Region	Division
Manpower						
Persons active in health field	45, 46					
Graduates (projections)		51				
Physicians						
Total active				47		
Medical doctors		49, 52	48			
Active non-Federal M.D.'s		50	50		50	

	Specialty	Type of ownership	Beds	Employees	Outpatient visits	Occupancy rates	Certification	Other variables	Geographic area	
									Region	Division, State
Facilities										
Short-stay hospitals	53	53	53							
Long-stay hospitals	58	58	58							
Community hospitals			54	56	57	55				54-57
Nursing homes		59	59			59	59	59	59	

IV. HEALTH CARE EXPENDITURES	Age	Type of expenditure	Source of funds or payment	Other variables	Geographic region
National health expenditures		68, 69	65, 66	60	
Public program expenditures (including Medicare and Medicaid)	74	74-76			
Personal health care expenditures	73	73	67, 73	61	
Consumer Price Index		62-64			
Hospital costs and expenses				70, 71	
Nursing home charges			72	72	72
Health research and development expenditures			77	78	

Part 2

PREVENTION PROFILE

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Introduction[a]

Background

The recent enactment of Title IV of the Health Services and Centers Amendments of 1978 (Public Law 95-626) reflects growing public interest in disease prevention and health promotion. Section 404 of this Title requires the Secretary of the Department of Health and Human Services to submit a national disease prevention profile to Congress every 3 years. The submission of this report fulfills that requirement.

Preventing disease and safeguarding against injuries are hardly new concerns of the American people. Citizens, professionals, and legislators joined in determined pursuit of these goals during the latter part of the 19th and the early years of the 20th centuries. This pursuit brought signal victories over the major diseases that afflicted the population in those times and began a continuing, if spasmodic, interest in environmental and occupational safety. Protective measures were identified and adopted against smallpox, malaria, cholera, typhoid fever, scurvy, rickets, pellagra, and other conditions. The spread of tuberculosis was gradually halted. Conditions such as childbed fever, infant diarrhea, and poliomyelitis—which once singled out particularly vulnerable segments of our population for death, chronic debilitation, or crippling—were for the most part relegated to history books.

Now the question becomes whether prevention, which worked so successfully in the past, can be employed to reduce the incidence of major diseases today. Heart disease, cancer, stroke, and accidents are some of the conditions that create the heaviest burdens on our population and our economy as we enter the 1980's.

The question was addressed extensively in the report *Healthy People*, published by the Office of the Assistant Secretary for Health and the Surgeon General (OASH-SG, 1979a). That report reviews opportunities for preventing the most common health problems encountered by each of the following age groups: infants (under 1 year of age); children (1-14 years of age); young adults (15-24 years of age); adults (25-64 years of age); and older adults (65 years of age and over). It also points out disturbing instances when our understanding of what needs to be done to prevent specific diseases and conditions has outstripped what has been done.

Following the Surgeon General's report, opportunities for prevention were delineated in greater detail in approximately 200 specific objectives that the Nation could reasonably expect to attain by 1990 (Office of the Assistant Secretary for Health and the Surgeon General, 1980). Knowledgeable professionals and laymen developed these objectives for the following 15 areas: high blood pressure control; family planning; pregnancy and infant health; immunization; sexually transmitted diseases; toxic agents; occupational safety and health; accidental injury control; dental health; control of infectious diseases; smoking; misuse of alcohol and drugs; nutrition; physical fitness and exercise; stress, violence, and mental health.

This prevention report comes at a particularly appropriate time. In it are assembled the most recent data available for areas in which preventive actions are now being taken and/or in which opportunities for new activities have been well charted. These data establish baselines against which future progress toward national objectives can be tracked.

By definition in the context of health, prevention requires action to reduce or eliminate risk of exposure that would increase the chances for an individual or group to incur disease, disability, or untimely death. Prevention also includes discovering and controlling abnormal conditions soon enough to minimize dangerous consequences. Examples are detecting and controlling high blood pressure and detecting and remedying inadequate shielding of X-ray equipment.

Some kinds of preventive actions, such as stopping smoking, can be taken only by the individual at risk. Others, such as immunization, call for the services of health professionals. Still others, such as the control of toxic agents in the environment, demand

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[a] This report was prepared by Katharine G. Bauer, Senior Advisor, Office of Disease Prevention and Health Promotion, Office of the Assistant Secretary for Health, and Ronald W. Wilson, National Center for Health Statistics.

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the broad involvement of many sectors of society—private and government. As these examples illustrate, some prevention measures are targeted to individuals and some to groups of individuals or entire populations at risk. By the same token, certain preventive measures, such as tests for cervical cancer, take place in physicians' offices and ambulatory care centers; others, such as metabolic screening of the newborn, are done in hospitals; and many are best accomplished in a variety of nonmedical settings—in peoples' homes, in schools, at the worksite, in the board rooms of consumer product manufacturers, and in State and Federal legislatures.

Regardless of where the potential for control is located, success in prevention requires knowledge about the nature and extent of the antecedent risks, about the particular groups exposed to such risks, and about the actions necessary to reduce them. It is the task of epidemiologic, biomedical, and behavioral research to expand the store of necessary knowledge in all these matters.

The Nation's resources are limited, and choices must always be made between competing courses of action. Thus data are required to document the relative extent to which various health problems might be reduced through preventive measures and the salience of these problems to particular age and ethnic groups of the population and to populations living in different geographic locations. This report presents data that are presently available to provide this kind of documentation.

Section I presents a general overview of the burden of illness in the United States today and outlines the major health problems that confront people in different age groups of our population, relating them to the goals for prevention set forth in the Surgeon General's prevention report. Section II introduces some facts on the economic costs of the leading causes of death. Section III documents control efforts and apparent successes and failures of prevention, as evidenced either in trends over time or by differences in rates among subgroups of our population. Section IV establishes the framework for a continuing profile of the Nation's opportunities and accomplishments in reducing risks to health. It identifies a series of prevention indicators and, for each one, presents the most recent data to show where the Nation currently stands. Succeeding prevention reports will track the changes in each of these indicators, marking progress toward the national objectives established for attainment by 1990.

As a background for these sections, this introduction concludes with an overview of the spectrum of risks to health and some observations on the uneven state of knowledge both about the risks and about the effectiveness of measures to reduce them.

Factors Affecting Health

In general terms, health or its absence is determined by a variety of factors operating in one or more of the following spheres:

- *Human Biology*, including genetic components.
- *External Environment*, including the objects within it.
- *Lifestyle*, the customs and habits of living.
- *Health Promoting and Restoring Systems* of society, including environmental control and regulatory measures, efforts to influence lifestyle, and preventive and medical treatment services of the health care systems.

In considering the risks to health and the challenges to prevention, it is useful to follow the approach first developed in Canada by LaLonde (figure 1). Each health determinant is visualized as an entity for which different intervention or support strategies need to be devised (LaLonde, 1975). In such a scheme, preventive services of the health system will be used to contravene risks inherent in some aspect of human biology, such as administering a vaccine to overcome inherent susceptibility to rubella; protective measures, such as safety regulations, will be used to protect against hazards in the environment; and health promoting communications, such as media campaigns and school health education programs, will be used to motivate change to healthier lifestyles.

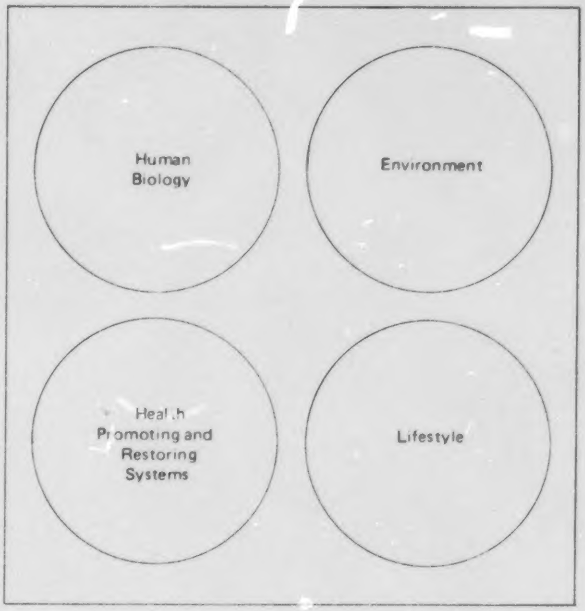


Figure 1. Factors affecting health

In some cases, one can clearly assign to a single one of these health determinants not only the risk factors for a condition but corresponding prevention measures as well. For example, physical contact with asbestos on the job constitutes a known environmental risk for asbestosis; elimination of that exposure at the worksite constitutes the known protective measure for preventing that disease among future employees and their families.

Such simple cause and effect relationships do not, however, apply to many of the Nation's major health problems. For example, the risk factors implicated in heart disease and stroke relate to at least two spheres of health determinants as follows: high blood pressure and family history relate to *Human Biology*; smoking, diet, and exercise relate to *Lifestyle*. Stressful work conditions are also a suspected risk factor; should research establish a significant association, *Environment* would become a third possible determinant. Correspondingly, action to reduce the risks associated with heart disease and stroke in the population must be multifaceted. Individuals have the principal roles in reducing risks associated with their hazardous lifestyles, but their families, their employers, and the manufacturers of the products they use also play crucial parts.

Reducing the risks of any disease through preventive measures usually requires comprehensive strategies within the *Health Promoting and Restoring Systems*, based on understanding the risk determinants particular to the case. Motor vehicle accidents provide an example of the wide range of interacting risk variables that must be taken into account by those responsible for designing interventions. These include: engineering defects in the vehicles; hazards in the design of roads, culverts, highway dividers, and light poles; driver impairment by alcohol or combinations of alcohol and prescribed or illicit drugs; use of seat belts and airbags; enforcement of speed limits; and availability of emergency medical services. When two, three, or more hazards occur simultaneously, risks are known to increase exponentially; this, too, must be taken into account.

Thus a more realistic way to depict the determinants of health, regarding risks and potential preventive approaches, is through a model that suggests the interactive nature of their relationships (figure 2). Applying this model to risk factors for particular diseases or conditions will produce circles of different relative sizes and different degrees of overlap. For Tay-Sachs disease, the *Human Biology* circle overwhelmingly dominates; for cirrhosis of the liver and lung cancer, *Lifestyle* becomes paramount.

Unfortunately, the ways in which concurrent risk factors interact are only beginning to be understood. Research in this interaction, as in most other aspects of prevention, has been scant. Several epidemiologic studies suggest that the effects of such interaction may be powerful. For example, risks of cancers of the respiratory system are more than tripled when heavy smokers are exposed to certain toxic agents or dusts in the work environment. Risks of stroke among women using oral contraceptives are more than doubled among the subset who smoke.

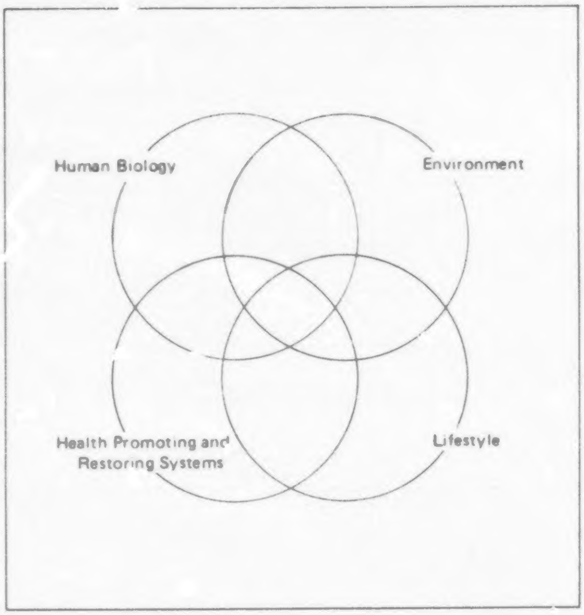


Figure 2. Interaction of factors affecting health

Other characteristics of risks that need to be taken into account are the heightened probabilities of health breakdowns that accompany both the intensity of a risk exposure and its continuation over time. For example, white men 30-39 years of age who smoke more than one pack a day are almost three times as prone to heart attacks as are nonsmokers (National Heart, Lung, and Blood Institute, 1970).

Limits on Knowledge

It would be a mistake to leave the impression that we now have the knowledge to assign risk factors to all diseases and to deploy effective prevention strategies to reduce them. Medical science has given us abilities to cure no more than a small fraction of the diseases that most commonly beset the U.S. population, with the result that most health system resources must be devoted to amelioration and palliation. By the same token, knowledge of the factors that predispose to these diseases and knowledge about how to mount effective risk interventions are also severely limited (Thomas, 1977). Degrees of knowledge about effective prevention, as about effective therapy, vary considerably from one disease or

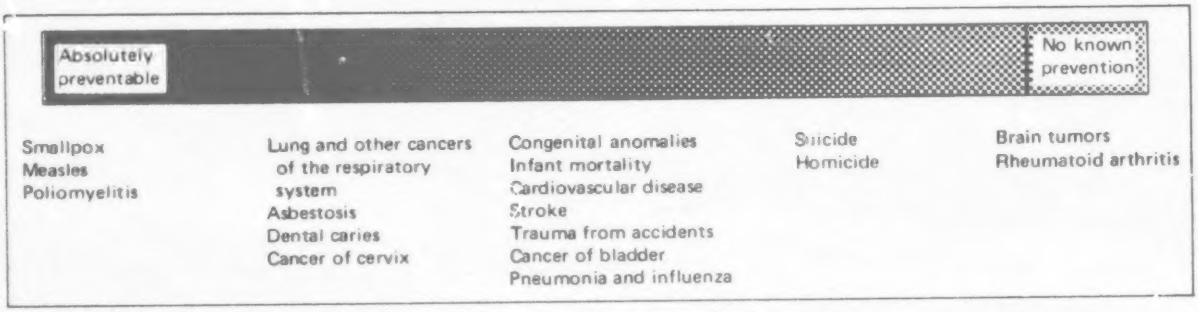

Absolutely preventable
No known prevention
Smallpox
Measles
Poliomyelitis
Lung and other cancers of the respiratory system
Asbestosis
Dental caries
Cancer of cervix
Congenital anomalies
Infant mortality
Cardiovascular disease
Stroke
Trauma from accidents
Cancer of bladder
Pneumonia and influenza
Suicide
Homicide
Brain tumors
Rheumatoid arthritis

Figure 3. A continuum for preventability

condition to the next. The state of the art in these respects has been reviewed elsewhere (OASH-SG, 1979b). However, the knowledge of potential risks and risk reduction measures covers a broad spectrum. It ranges from a complete capability to eliminate sickness or death from a particular cause to complete ignorance of risks or strategies for early intervention.

Between these extremes lies a host of diseases and conditions for which risk factors are understood in varying degrees and where preventive measures, if adopted, can be expected to have varying degrees of impact. Figure 3 sets forth in schematic fashion examples of conditions to illustrate this range of possible prevention impact, given present levels of knowledge about risk factors and potentially feasible means of reducing them.

The shading in figure 3 represents the probability for preventing diseases or conditions by applying known intervention methods. The darkest area at the left end of the shaded bar indicates conditions that can unequivocally be prevented. In the center, moving from left to right, are some conditions where drastic, sizable, or at least some reductions in risks could be achieved. The lightest area at the right end of the bar illustrates conditions where no progress in reducing risks can be expected until breakthroughs in knowledge are made.

Looked at another way, the probability of preventing the onset of measles and poliomyelitis by applying known intervention measures is nearly 100 percent, and the probability of preventing brain tumors by such applications is zero. It is far more difficult to assign probability of success or failure to the various diseases and conditions that occupy the center of the chart. Here, knowledge of specific risk factors may be satisfactory, incomplete, or only sketchy. Also, the potential of intervention strategies to reduce such risks may depend heavily on the characteristics of the people the preventive measures attempt to reach, the appropriateness of the particular measures selected to reach them, and the skill with which these measures are applied. Thus the order and placement of the diseases and conditions listed in the center portion of figure 3 are intended only to be illustrative.

In short, the potential scope of disease prevention and health promotion is vast, the types of possible interventions extraordinarily varied, and the knowledge base uneven. Thus large generalizations about the likely future role of prevention in reducing premature death and avoidable disability are dangerous. Fortunately, the data in section I indicate that many of the diseases and conditions that constitute the Nation's most pressing health problems are ones where knowledge of risks and effective risk reduction approaches are present and growing.

SECTION I: The Illness Burden That Prevention Could Reduce

Overview

This section describes the major challenges to prevention of avoidable illness and disability today as defined by the conditions that constitute the Nation's leading causes of death and potential years of life lost. These conditions are then juxtaposed to a summary of risk factors whose reduction might be expected to lighten the burden to a greater or lesser degree. The challenges to risk reduction in different age groups are reviewed.

Leading Causes of Death Today and Yesterday

An average American baby born in 1978 can expect to live more than 26 years longer than one who was born in 1900. A large part of this dramatic increase in life expectancy results from the prevention and control of communicable diseases that formerly accounted for high rates of death among children and young adults. In 1915, when States first began to register births, 100 of every 1,000 babies born alive died during the next 12 months (Bureau of the Census, 1943). By 1950, this rate had fallen to 29.2 and, by 1978, to 13.8. Put another way, if the 1915 infant mortality rate had persisted, in 1978 more than 300,000 babies would have died whose deaths were in fact prevented. Had the 1900 death rates for tuberculosis, diarrhea, diphtheria, and poliomyelitis persisted, these diseases together would have prematurely claimed the lives of 840,000 Americans in 1977 (OASH-SG, 1979a).

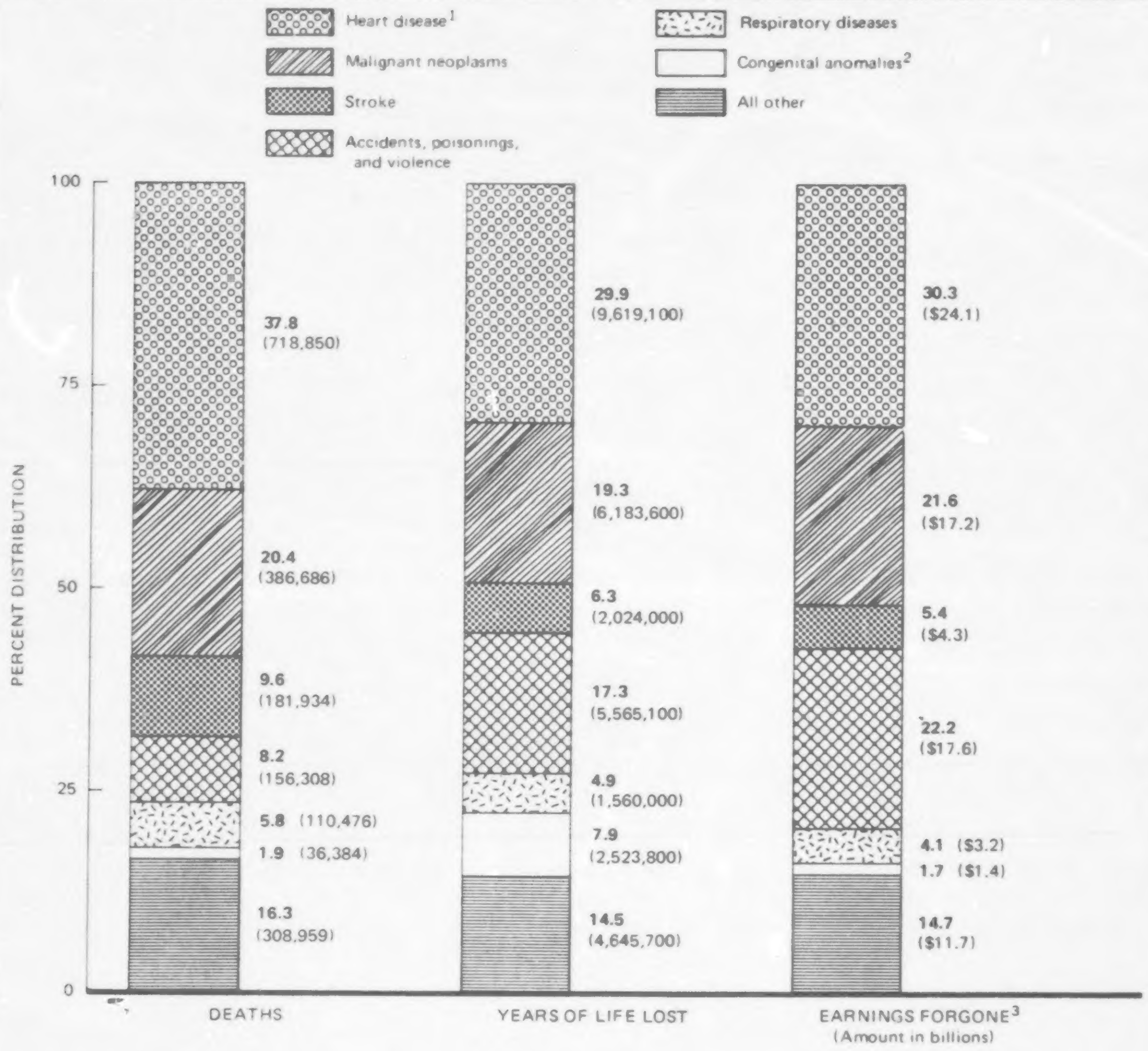
While continuing efforts to extend the control of communicable diseases and to reduce infant mortality among groups of the population where it is still inordinately high, the Nation now faces new challenges in its pursuit of prevention. The data in figure 4 indicate where these new challenges lie. As shown in the left-hand bar, the four leading causes of death in 1975 were heart disease, malignant neoplasms (cancer), stroke, and accidents, poisonings, and violence. Together, they account for 4 out of 5 deaths. Heart disease accounts for about 2 in 5 deaths, cancer 1 in 5, and accidents 1 in 10. The category respiratory diseases also figures as a numerically important cause of death.

The middle bar shows the impact of five leading categories of disease on years of lost life, based on current life expectancy rates at each age. Heart disease and cancer again dominate; but, because these diseases strike at higher rates of frequency in older age groups, they account for a smaller proportion of lost years than they do of deaths. Also, because children, teenagers, and young adults are the most frequent victims of accidents and violence, the proportion of potential years of life lost from this cause is almost twice as high as the proportion of deaths. Finally, deaths associated with congenital anomalies and certain causes of perinatal mortality, though relatively small in number, account for a sizable proportion of total years of potential life lost because they occur at the early end of the life span.

The right-hand bar shows the present value of lifetime earnings lost due to premature mortality. The percent distribution of lost earnings follows closely that for years of life lost, with deaths resulting from heart disease, cancer, and accidents accounting for about three-fourths of the total. Heart disease accounts for 38 percent of deaths, but accounts for only 30 percent of lost earnings because these deaths occur rather late in life at ages for which relatively few productive years remain. Accidents, on the other hand, represent only 8 percent of deaths but account for 22 percent of lost earnings because deaths due to accidents occur at relatively young ages and many years of potentially productive activity are lost.

In summary, heart disease, cancer, stroke, accidents, and congenital anomalies present major challenges to prevention measured in terms of total deaths that might be avoided or years of life to be added and lost earnings that could be saved.

In figure 5, age-adjusted death rates are shown for the five leading causes of death in 1977 and in 1900. As can be seen, the three disease categories most



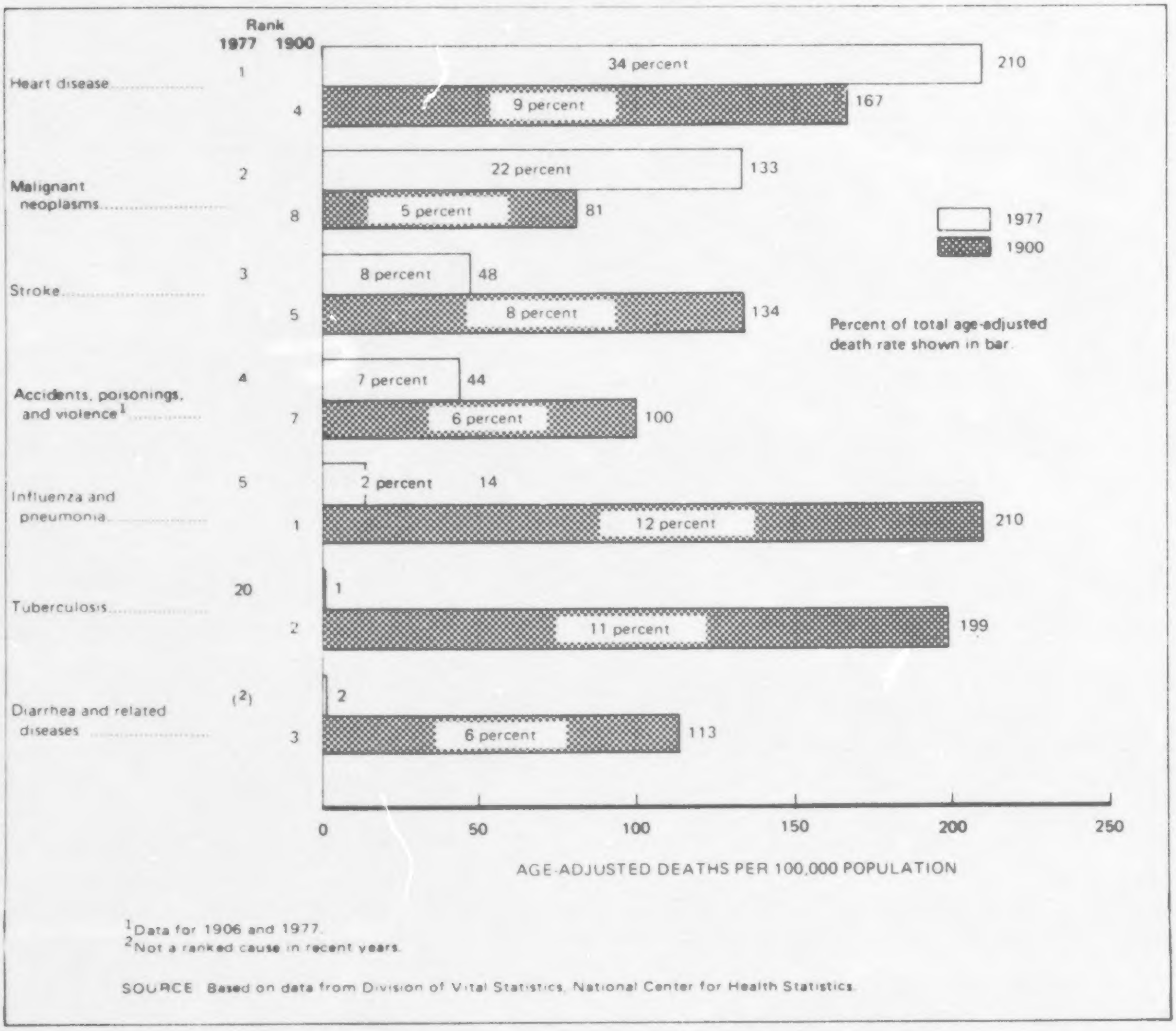
[1] Diseases of the circulatory system excluding stroke.
[2] Includes certain causes of perinatal mortality.
[3] Discounted at 10 percent.

SOURCE: National Center for Health Statistics: Computed by Division of Analysis from data compiled by Division of Vital Statistics.

Figure 4. Number and percent distribution of selected causes of death, potential years of life lost, and earnings forgone: United States, 1977

prevalent at the turn of the century were influenza and pneumonia, tuberculosis, and diarrhea and related diseases. Deaths from these conditions have been prevented or controlled, and the conditions that occupy center stage today are quite different. The age-adjusted death rate for influenza and pneumonia in 1900 was equal to the present rate for heart disease, and the rates for tuberculosis and diarrhea were in excess of the present rate for cancer. Accidents and stroke increased with respect to rank order of causes of death, but the age-adjusted death rates from these conditions were enormously reduced.

The relative positions of the leading causes of death today are very different from what they were in 1900. The four leading causes in 1977 accounted for 71 percent of all deaths, but the four leading causes in 1900 accounted for only 40 percent. While part of this difference may reflect changes in death reporting, the figure indicates the greater variety of lethal illnesses to which the population of 1900 was subject. Successes in preventing or controlling the



[1] Data for 1906 and 1977.
[2] Not a ranked cause in recent years.

SOURCE: Based on data from Division of Vital Statistics, National Center for Health Statistics.

Figure 5. Age-adjusted death rates for the 5 leading causes of death in 1900 for 10 States and the District of Columbia and in 1977 for the United States

century introduced another type of risk. The effects diseases most prevalent at the turn of the century reflect the combined contributions of epidemiology, public health and sanitary engineering, medical science, technology, and a steadily rising general standard of living that has led to improved levels of nutrition and education.

On the other hand, the current preponderance of heart disease, cancer, stroke, and accidents and violence as major causes of death reflects to some degree the introduction of risks or increases in risks less prevalent in 100. The introduction of the automobile is an obvious example. Motor vehicle accidents now account for almost half of all accidental deaths; and automobiles, their many benefits notwithstanding, have also become an important direct and indirect source of air pollution. The widespread adoption of cigarette smoking after the turn of the century introduced another type of risk. The effects on health of many other changed circumstances in 20th century living—such as, new dietary patterns, the introduction of new chemicals into the environment, and decreased levels of physical activity at work—are only beginning to be understood.

Up to this point in the section, the figures have presented a limited number of major causes of death. In figure 6, the list is expanded to 10, which together accounted for 82 percent of the Nation's deaths in 1977. Two of the categories in this figure, motor vehicle accidents and accidents other than motor vehicle are broken out of the single inclusive category accidents, poisonings, and violence, used in the earlier figures. The categories diabetes, cirrhosis of the liver, arteriosclerosis, and suicide are introduced. Although they represent only small percentages of total deaths, each poses special problems for particular age groups in the population.

The juxtaposition of one or more risk factors with which each of these 10 causes of death is associated suggests major challenges to and opportunities for prevention. In each instance, the association of the risk factors with the diseases here listed either has been statistically established as significant or has been suggested as relevant, as in the case of stress and lack of physical exercise.

As can be seen, some risk factors relate to personal lifestyle, some to inherited biologic characteristics, and some to environmental hazards. Thus actions to control these risks are required by individuals themselves, by the medical, public health, and engineering professions, and by public policymakers.

Not too many years ago, chronic diseases and accidents were accepted as inevitable blows of inscrutable fate or as natural concomitants of aging. Many of the risk factors that are associated with these conditions remain unidentified, but some actions have been indicated that could possibly reduce the very heavy burdens of illness and death.

Challenges to Risk Reduction in Different Age Groups

Looking at the major causes of death for the total U.S. population conceals important differences in the risks to health experienced by people in different age groups. *Healthy People* (OASH-SG, 1979a) points up some of these differences, reviews major opportunities for prevention, and sets national goals for different age groups. Highlights are summarized here.

Major Risks to Health of Infants—Under 1 Year of Age

Despite the dramatic decline in infant mortality throughout the 20th century, the first year of life remains a hazardous one. With the exception of people 65 years of age and over, death rates for infants exceed those at all other times of life.

Infant deaths today are principally associated with 1 of 3 causes, as illustrated in figure 7: immaturity-associated (low birth weight) and birth-associated conditions and congenital birth defects. Deaths associated with these conditions tell only part of the story because survivors of all these conditions have greatly increased chances of experiencing developmental problems and severe, lifelong disabilities.

About 7 percent of American babies are of *low birth weight* (2,500 grams or less). This percentage is higher than that for several Western European countries, which may account for lower infant mortality rates for those countries. In Sweden, for example, only 4 percent of newborns are of low birth weight. Pregnant women who lack proper nutrition incur greater risk of either bearing infants of low birth weight or having stillborn infants. Maternal smoking has been identified through recent research as another risk factor to pregnancy outcome. Smoking is associated with slow fetal growth, doubling the chance of having an infant of low birth weight and increasing the risk of stillbirth (Meyer, 1978).

Major causes of deaths, 1977		Risk factor
Cause	Percent of all deaths	
Heart disease	37.8	Smoking,[1] hypertension,[1] elevated serum cholesterol[1] (diet), lack of exercise, diabetes, stress, family history
Malignant neoplasms	20.4	Smoking,[1] worksite carcinogens,[1] environmental carcinogens, alcohol, diet
Stroke	9.6	Hypertension,[1] smoking,[1] elevated serum cholesterol,[1] stress
Accidents other than motor vehicle	2.8	Alcohol,[1] drug abuse, smoking (fires), product design, handgun availability
Influenza and pneumonia	2.7	Smoking, vaccination status[1]
Motor vehicle accidents	2.6	Alcohol,[1] no seat belts,[1] speed,[1] roadway design, vehicle engineering
Diabetes	1.7	Obesity[1]
Cirrhosis of the liver	1.6	Alcohol abuse[1]
Arteriosclerosis	1.5	Elevated serum cholesterol[1]
Suicide	1.5	Stress,[1] alchohol and drug abuse, and gun availability

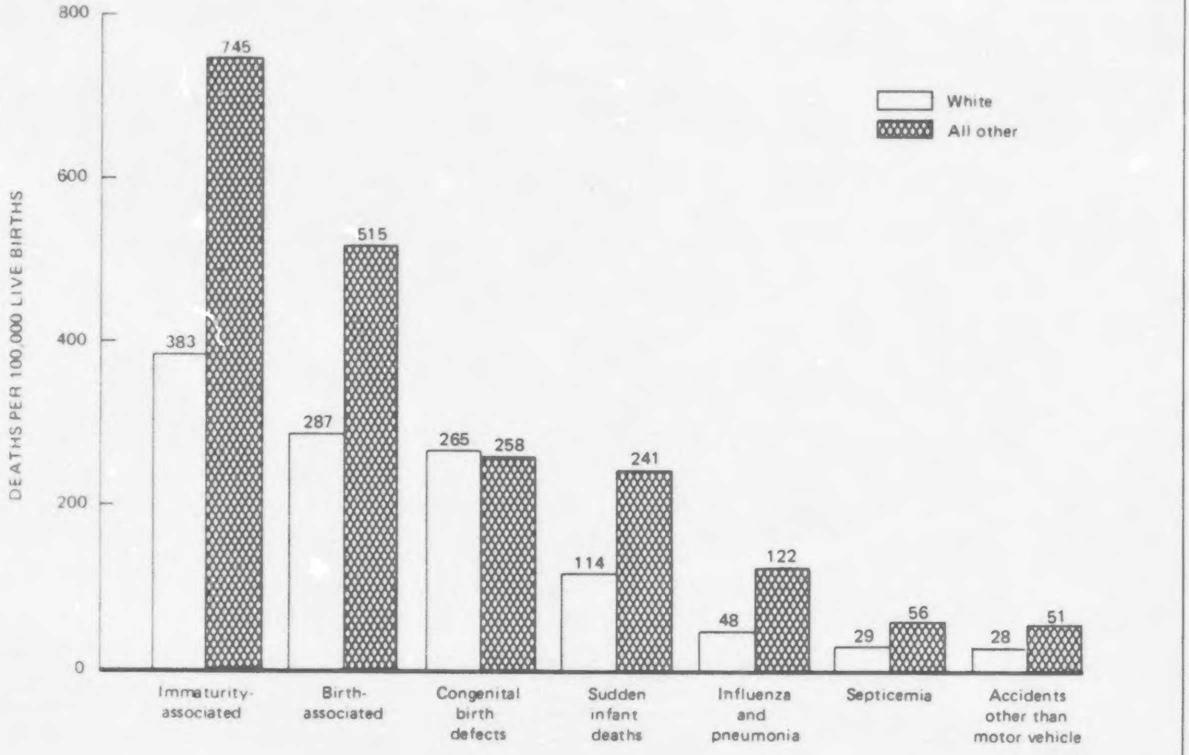
[1] Major risk factors.

SOURCE: Office of Disease Prevention and Health Promotion.

Figure 6. Major causes of death in 1977 and associated risk factors

Reduction of deaths from *birth-associated* conditions depends in part on early identification and clinical management of medical risk factors during the course of prenatal care. However, many childbirth risks cannot be detected in advance; thus prompt care by skilled professionals is required at the time of delivery.

Given current knowledge, many *congenital birth defects* cannot be prevented, but many can be. Such defects include congenital physical anomalies, mental retardation, and genetic diseases. The Center for Disease Control estimates that the incidence of mental retardation could be reduced 20 percent if known preventive measures were to be universally applied. Examples of measures include newborn screening



SOURCE: (Office of the Assistant Secretary for Health and the Surgeon General, 1979a)

Figure 7. Major causes of death among infants, according to color: United States, 1976

and prompt continuing treatment of phenylketonuria (PKU) and congenital hypothyroidism.

Birth defects may be caused by inherited factors or can result from exposure of the fetus to infectious or toxic agents during pregnancy, especially during the first 3 months. Detection of many genetic disorders before, during, and shortly after pregnancy is possible, as are options for interventions. Hazards to the fetus from its prenatal environment can be reduced. Risk factors to the fetus in its prenatal environment include but are not limited to the following:

- Rubella (German measles) when it affects a mother during the first trimester.
- Radiation and chemicals in the mother's workplace, especially during the early weeks of fetal development, and exposure to X-rays.
- Certain medications ingested by the mother.
- Smoking.
- Alcohol consumed by the mother, especially in excess of one ounce daily, in early pregnancy.

Because of the many opportunities for risk reduction, the goal set by the Surgeon General is to reduce infant mortality by at least 35 percent by 190, to fewer than 9 deaths per 1,000 live births.

Major Risks to Health of Children—1-14 Years of Age

Children have benefited to an extraordinary degree from the prevention and treatment of the many communicable diseases that used to threaten their lives and health. The death rate for children 1-14 years of age had been 870 per 100,000 in 1900; by 1978, it had fallen to a record low of 43. Accidents have replaced diseases as the major risks to children's lives today.

Almost 10,000 American children were killed in accidents in 1978, more than four times as many as died from cancer, the next leading cause. While "accident" is commonly used to describe unintentional injuries to the human body, it is an unfortunate term to use because it connotes acts of fate beyond human power to control. In fact, the majority of such events can be prevented through changes in lifestyle or in the environment or in both.

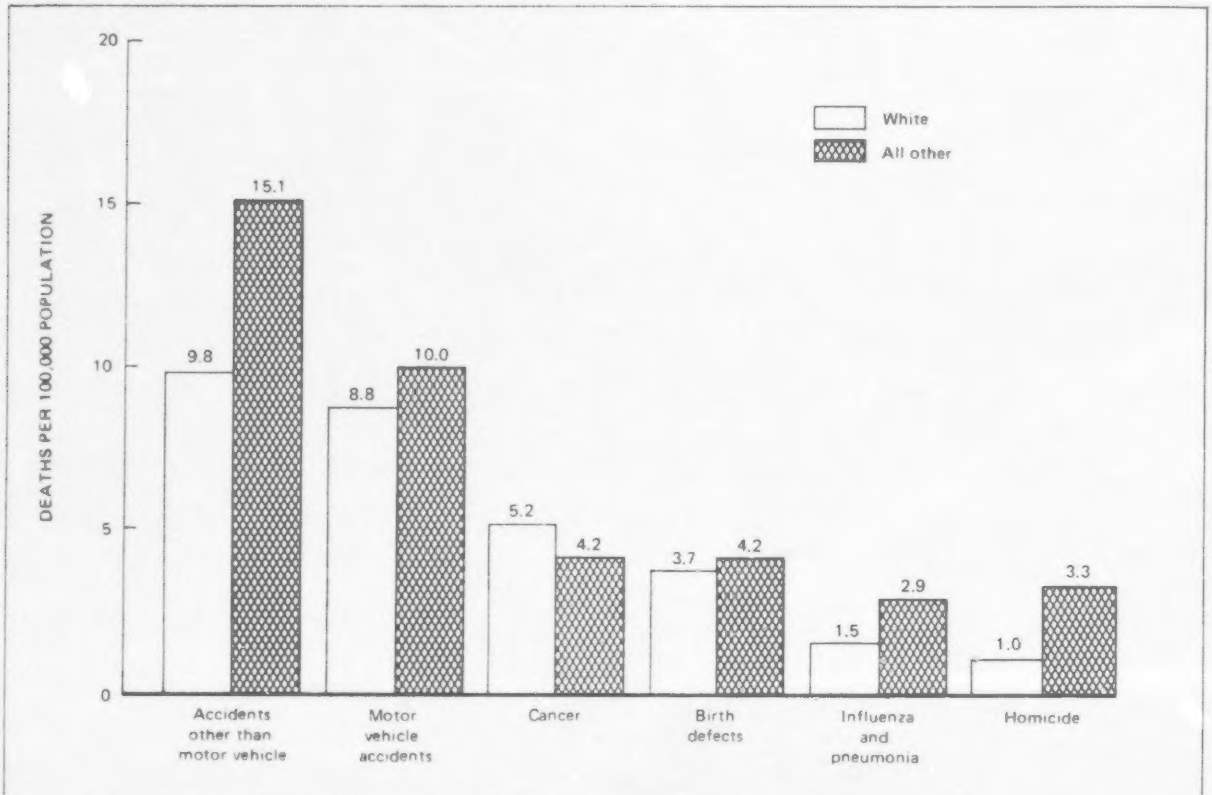
The opportunities for prevention become self-evident when childhood deaths resulting from *accidents* are analyzed by type. Almost half of such deaths are associated with motor vehicles. As figure 8 shows, such accidents are the second leading cause of death for children. Failure to place small children in car safety restraints and to enforce wearing seat belts among older children as well as dangerous driving constitute major risk factors.

Accidents other than motor vehicle constitute the leading cause of children's deaths. Risk factors include both lack of appropriate supervision and exposure to environmental hazards. Drownings account for 8 percent and residential fires for 6 percent of deaths. Access to toxic substances in the home—such as, drugs, cleaning agents, and plant sprays—presents another class of risks. Poisoning deaths have declined sharply with the advent of childproof packaging, but they still account for 4 percent of the deaths resulting from other than motor vehicle accidents among children under 5 years of age. Each year ingestion or inhalation of lead causes central nervous system damage or mental retardation in 6,000 children and death for another 300-400.

Most childhood accidents are not fatal. Nevertheless, they usually cause suffering, often cause permanent impairment, and almost always create demands on the health service system. Most nonfatal accidents are associated with recreational activities and equipment.

In examining other leading causes of children's deaths, the opportunities for reducing risks become less clear. The risk factors for *childhood cancer* are not yet well understood. Fortunately, recent advances in treatment have considerably improved the chances of survival. Deaths from *birth defects* partially reflect failures of amelioration at earlier ages. The numbers of deaths caused by *influenza and pneumonia* among this age group are in fact already quite low; how much further reduction can be made is uncertain.

That *homicide* constitutes a major cause of death for American children is shocking, especially because it serves as merely one measurable indicator of child abuse and neglect that may take many forms. Child abuse is greatly underreported, but estimates of cases range from 200,000 to 4 million a year. Child neglect, emotional and physical, is generally thought



SOURCE: (Office of the Assistant Secretary for Health and the Surgeon General, 1979a)

Figure 8. Major causes of death among children 1-14 years of age, according to color: United States, 1976

to be more common. Its long-term consequences to physical and mental health may be equally serious. The complex interacting forces that lead parents and other caretakers to neglect or abuse children are not as yet well understood. However, risk factors include alcohol, general family disorganization and instability, inability to manage stress, and unrealistic parental expectations. Unwanted children, children of teenage mothers, and children in families with closely spaced children are believed to be at special risk.

Other *barriers to healthy growth* of children are not reflected in death and injury rates but do interfere with normal intellectual and physical development and can create risks to health in adult life. For example, vision problems can impair learning ability if they remain uncorrected. During 171-72, 24 percent of children 6-17 years of age had vision problems; 3 percent of these problems were uncorrected. Improper nutrition has been associated with slow mental development. Fortunately, nutritional deficiencies in the population have greatly decreased. However, ill-advised food choices and poor eating habits begun in childhood may have both short-term and long-term consequences. For example, the frequent consumption of sugar increases the risk of dental caries. In addition, too much fat, saturated fat, and cholesterol may contribute to risk of heart disease in adult life.

Major threats to child health could be reduced by preventing children's involvement in motor vehicle and other accidents. A 50-percent reduction in fatal accidents would be enough to achieve the Surgeon General's goal of fewer than 34 deaths per 100,000 children by 1990. At the same time, many other not so easily quantifiable obstacles to healthy emotional and physical development of children need to be addressed through preventive measures.

Major Risks to Health of Adolescents and Young Adults—15-24 Years of Age

Many of the tragedies from violent death, sterility, and parenthood that occur to young people appear to be associated with inability to deal appropriately with the strains, opportunities, and responsibilities that accompany the transition from child to adult status. Unlike Americans in every other age group, the death rate for the 40 million adolescents and young adults is higher today than it was 20 years ago. The major health problems for this age group are violent death and injury, alcohol and drug abuse, unwanted pregnancies, and sexually transmitted diseases. As the data in figure 9 indicate, accidents, homicides, and suicides are by far the leading causes of mortality. Together they account for about 75 percent of the deaths.

Excessive driving speed and alcohol, as young people and others recognize, are strongly associated with *motor vehicle accident fatalities*. Alcohol-related accidents are the leading cause of death for those 15-24 years of age, and 60 percent of all alcohol-related highway traffic fatalities are among this age group. Risks from alcohol and fast driving are exacerbated by failure to use seat belts.

The social, psychological, and cultural reasons behind the high rates of *homicide* in the United States are infinitely complex, but alcohol appears again as one of the precipitating risk factors. Easy access to firearms appears to be another.

In 1976, more than 1 of every 10 teenagers and young adults who died committed *suicide*. Firearms are used in suicides more than four times as often as poisoning, the second most frequent method.

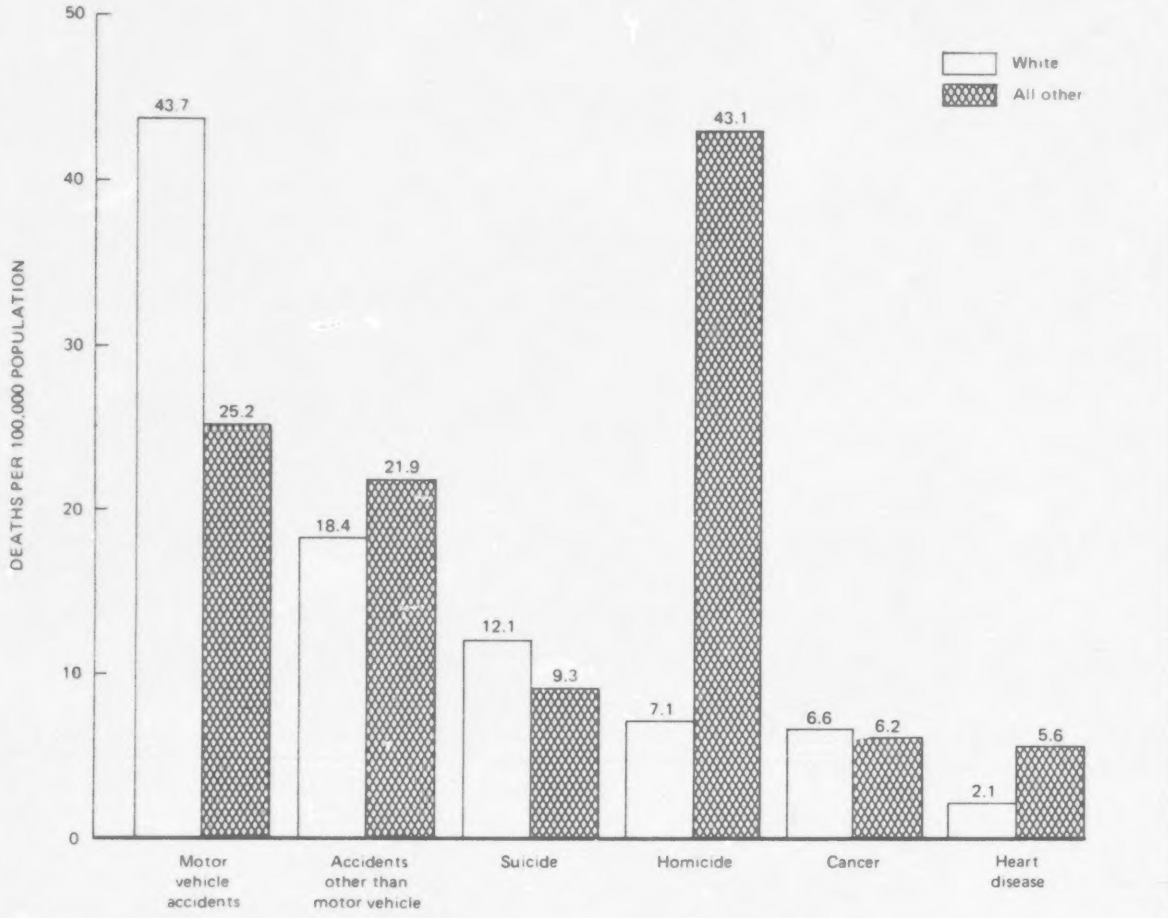
Adolescents and young adults are particularly prone to infection from *sexually transmitted diseases*. These young people experience 75 percent of the estimated 12 million cases of such diseases that occur each year. Young people are most apt to contract and spread sexually transmitted diseases, but women and children are most likely to suffer the worst consequences. Chlamydia, one form of sexually transmitted diseases, causes an estimated 50,000 eye infections and 25,000 cases of pneumonia each year in infants. The most serious complications caused by these diseases are pelvic inflamatory disease, sterility, infant pneumonia, infant death, and mental retardation among offspring.

Pelvic inflamatory disease accounts for over a quarter of a million hospitalizations and 50,000 surgical procedures each year, most among women and many involving total removal of the reproductive organs. Sterility due to pelvic inflamatory disease currently affects over 50,000 women annually.

Risk of sexually transmitted diseases is greatly reduced by consistent use of condoms. Transmission of such diseases and limitation of disability or complications associated with such disease can be curtailed through early diagnosis and treatment. However, effectiveness depends on reaching patients who attend clinics and those identified in screening programs as well as all contacts.

Birth control methods currently prevent an estimated 750,000 *unwanted pregnancies* among teenagers each year. However, teenage girls are the age group least apt to avail themselves of this protection. Each year about 1 million teenagers, 1 of every 10, becomes pregnant; of these, two-thirds are unmarried and about 3 in 10 elect to terminate pregnancy. The babies of teenage mothers are at special risk of low birth weight and other unfavorable outcomes. The mothers face serious problems of disrupted schooling and public dependency.

The Surgeon General has set a national goal to improve the health and health habits of adolescents and young adults and, by 1990, to reduce deaths by at least 20 percent, to fewer than 93 per 100,000.



SOURCE: (Office of the Assistant Secretary for Health and the Surgeon General, 1979a)

Figure 9. Major causes of death among persons 15-24 years of age, according to color: United States, 1976

The specific challenges are to reduce fatal motor vehicle accidents, homicide, alcohol and drug abuse, unwanted pregnancies, and sexually transmitted diseases; but, strategies for action will need to be devised within this larger context.

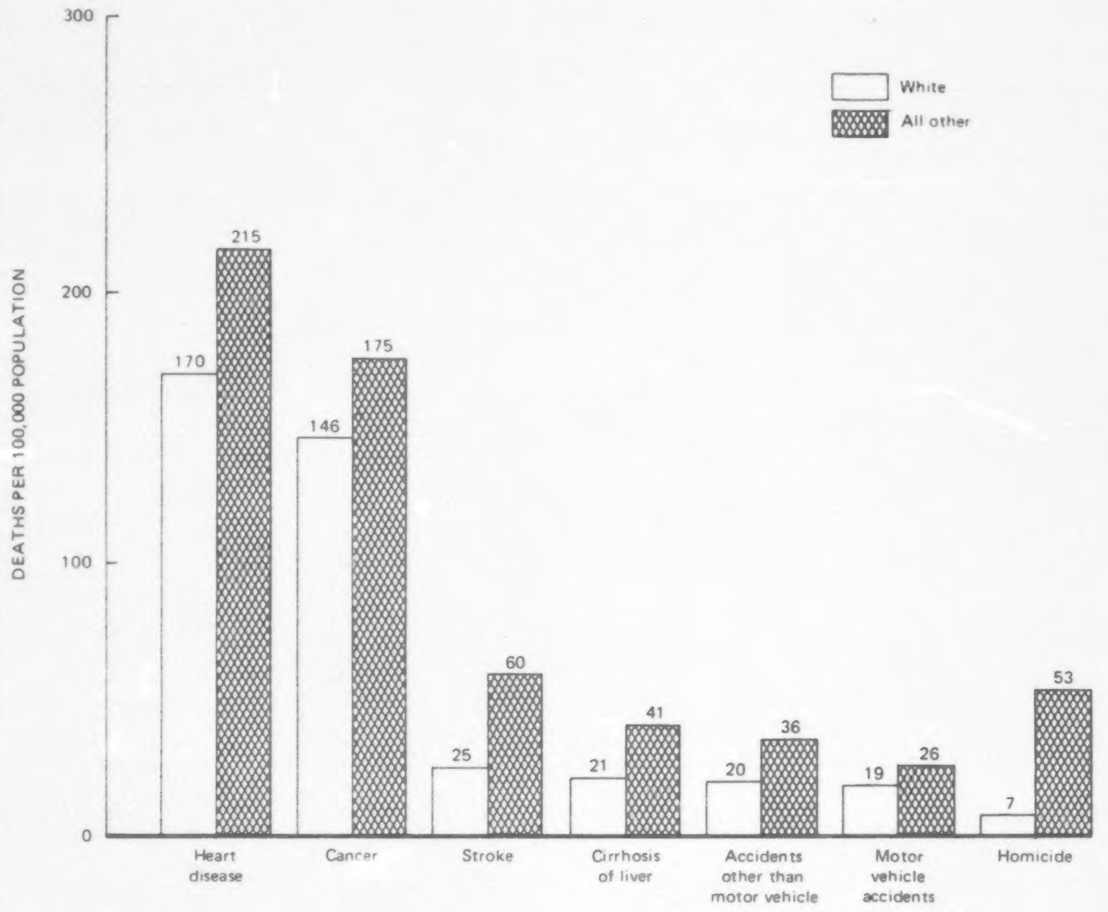
Major Risks to Health of Adults in the Middle Years—25-64 Years of Age

Among people in the middle years, heart disease, cancer, and stroke dominate all other causes of death. Cirrhosis of the liver, accidents, and homicide also rank high, but they account for considerably lower proportions (figure 10).

Approximately 170,000 people in this age group died in 1977 from heart disease . *Heart disease* is the leading cause of death for men over 40 years of age. The mortality rate for heart disease among premenopausal women is much lower than for men but gradually catches up after menopause. Not only is heart disease a major cause of death, but it is also the greatest source of permanent disability claims among workers under 65 years of age. *Stroke* remains the third leading cause of death in this age group and was responsible for almost 26,000 deaths in 177. Severe handicaps of motion, speech, and memory frequently afflict the survivors.

The major risk factors for *heart disease and stroke* are smoking, high blood pressure (i.e., systolic pressure of 140 mmHg or more or diastolic pressure of 90 mmHg or more), high serum cholesterol, and diabetes. The associated risk factors are as follows:

- The death rate for heart disease is nearly twice as great for cigarette smokers as for nonsmokers. The difference is much greater in people under 65 years of age. Risk is proportional to the number of cigarettes smoked.
- High blood pressure is significantly associated with coronary heart disease and stroke. The rate of coronary heart disease among men 45-



SOURCE: (Office of the Assistant Secretary for Health and the Surgeon General, 1979a)

Figure 10. Major causes of death among persons 25-64 years of age, according to color: United States, 1976

64 years of age is two to three times greater for those with pressures above 160/95 mmHg than for those with pressures below 140/90 mmHg; strokes are three times as frequent among people with systolic pressures above 160 mmHg as among those with systolic pressures below 140 mmHg.

- Premature heart disease is unequivocally associated with elevated serum cholesterol levels, which in turn are linked to high levels of fat (particularly saturated) and cholesterol in the diet. Heart attacks are five times as frequent in men and women 35-44 years of age who have serum cholesterol levels above 265 milligrams per deciliter as among those with levels below 220. However, current research suggests that measuring different types of lipoproteins, which are cholesterol carrier substances in the blood, may become a more accurate means of predicting heart attacks than measuring serum cholesterol alone.
- Diabetics have at least twice as many heart attacks and strokes as nondiabetics of the same age.

Risks for particular types of heart disease have also been found to be potentiated by certain drugs, including oral contraceptives high in estrogen, especially among smokers.

Other factors that appear to contribute to the risk of heart disease include overweight, physical inactivity, genetic predisposition, and personality patterns related to stress. The independent contribution of each of these factors is unknown because they usually occur in combination with the major risk factors.

Despite the strides made in identifying the various risk factors for heart disease and stroke, as yet there is no way to explain or predict a large portion of the cases that occur. Many smokers with high blood pressure and high serum cholesterol counts will escape premature death or disability from these diseases, and many nonsmokers apparently in prime physical condition will become victims of these diseases. Reducing risks can provide no guarantees, but it can measurably increase the chances for escape.

One in four Americans contracts *cancer*. It claimed the lives of almost 390,000 in 1977, 150,000 of whom were in the middle years of life. Cancer followed heart disease as a leading cause of death for those 25-64 years of age. Cancer is not a single disease but rather a group of diseases, each with its own rate of development and occurrence but having in common an uncontrolled multiplication of malignant cells. Some types grow slowly, others fast. An awareness of the multiplicity of cancer types is central to consideration of prevention, since environmental, biological, and lifestyle conditions that may be antecedent and predisposing are often different for cancers of different sites.

Almost half of all cancer fatalities are from the following three varieties: lung, large intestine, and breast. As already noted, lung cancer is the leading cause of death from this disease for men and, if present trends continue, may soon become the leading cause for women, replacing cancer of the breast. Men and women experience cancer of the intestine at about the same rate.

While the causes of most cancers are unknown, many contributing factors have been identified. For some, the extent of the added risk has been measured; for others, the results of research are not yet conclusive. Some of the major risk factors are smoking, alcohol, radiation, and chemical exposures at the workplace and in the water and air. Diet and heredity are also implicated.

- Cigarette smoking is responsible for more cases of cancer and more deaths from cancer than any other known agent. Smokers have about 10 times the frequency of lung cancer, 3-4 times the frequency of cancer of the oral cavity, more than 3 times the frequency of cancer of the larynx, more than twice the frequency of urinary bladder cancer, and about twice the frequency of cancer of the pancreas that nonsmokers have. Smoking can also increase the risks associated with other factors.
- Higher rates of cancers of the larynx, oral cavity, esophagus, and liver occur among people consuming large amounts of alcohol over time.
- The connection between cancer and direct radiation exposure both from X-ray equipment and from sunlight has long been established, and protective measures have been devised. However, problems remain in determining safe levels of exposure to low level radiation emanating from the many sources in the natural and manmade environment to which an individual may be subjected during the course of a lifetime. Methods to monitor such exposures are not yet developed.
- Occupational exposures to certain chemicals can cause cancers that are rare in the general population and can increase the incidence of common types. For example, plastic workers exposed to vinyl chloride are at 200 times greater risk for liver cancer, 4 times greater risk for brain cancer, and 2 times greater risk for lung cancer than the general population. Current epidemiologic evidence builds a convincing case for the carcinogenicity in humans of 20 chemicals and compounds. More than 2,300 other specific chemicals are suspected carcinogens.
- Potentially carcinogenic industrial and agricultural wastes have polluted the water, thereby exposing entire communities to increased risks of cancer. The extent to which hazardous waste disposal sites may prove to be time bombs in the future is unknown.
- Pollution of the air from automobile exhausts, burning of fuels, and industrial activities may be associated with increased lung cancer rates among the populations of certain communities, but the relationships are not yet well established.
- Certain foods—such as fats—and methods of food preparation—such as charcoal broiling—are under study as possible risk factors for certain types of cancers, as are certain methods of preserving—such as use of food additives and pickling. The role of fiber in the diet as a potential protective measure is also being examined.
- The significance of family history of cancer varies among cancer types. Sisters and daughters of women with breast cancer are known to be at higher risk of this condition. For most other types, the connections are not clear. Since families often share the same habits and physical environment over long periods of time, it is difficult to determine how much clustering of cancer can be assigned to heredity. The Surgeon General's report concludes that overall only 1 or 2 percent of cancers can be directly attributed to heredity.

The challenge in prevention of cancer is twofold. Measures taken to reduce factors that constitute known risks can lower the incidence of certain types of cancers—lung and other respiratory tract cancers being prime examples. Physical examinations or screening to detect and treat the condition before major spread can prevent death in certain other types—notably breast cancer and cancer of the reproductive organs.

Since cures are at best uncertain, preventing initial incidence is preferable. However, notwithstanding the many risk factors for cancer that have been identified, many more remain undiscovered. In addition, the increased probabilities of cancer incidence when one or more risk factors interact are only beginning to be quantified.

In 1977, 30,000 deaths were attributed to *cirrhosis of the liver;* of these, more than two-thirds were among people 25-64 years of age. Figure 10 shows cirrhosis to be the fourth leading cause of death among this age group. Alcohol is a contributor to 95 percent of such deaths. As already noted, alcohol is known to play a significant part in both motor vehicle and other than motor vehicle accidents and homicide, all of which remain important causes of death among adults in the middle years of life.

Many other acute and chronic health problems for which risk factors are unknown afflict people in the middle years without causing death. These include respiratory infections, digestive disorders, and arthritis. Periodontal disease is an example of a very prevalent oral disease, which is the primary cause of tooth loss in adults over 35 years of age. This disease can be prevented or controlled through proper, prompt, and continuing personal and professional care that emphasizes the importance of oral hygiene.

The Surgeon General's national goal is to improve the health of adults and, by 1990, to reduce deaths among people 25-64 years of age by at least 25 percent, to fewer than 400 per 100,000.

The public now has a greater understanding of the major risk factors that increase the probabilities for heart disease, cancer, and stroke. Therefore, it is reasonable to assume that present downward trends in the death rates of heart disease and stroke can be maintained and that certain cancers can be reduced. If so, the Surgeon General's goal will be attainable.

Major Risks to Health of Older Adults—65 Years of Age and Over

Most Americans 65 years of age and over live in their own homes and are healthy and independent. Only 5 percent live in institutions, many only while recovering from an illness. Nevertheless, the proportion of people with health problems increases with age. Up to 18 percent of people 65 years of age and over are in some way limited in their ability to move around freely; about 30 percent of them report their health as being poor or only fair, compared with 22 percent of people 44-64 years of age.

The major causes of death and handicap in this age group are similar to those for adults in the middle years (figure 11). Heart disease is preeminent, and cancer and stroke account for very large proportions. Sometimes, these major health problems are rooted in environmental exposures or lifestyle behaviors of such long standing that irreversible damage has been done. Sometimes, however, preventive interventions may provide a new lease on life. Such interventions include controlling high blood pressure, stopping smoking, changing to healthier diets, and participating in moderate exercise regimes.

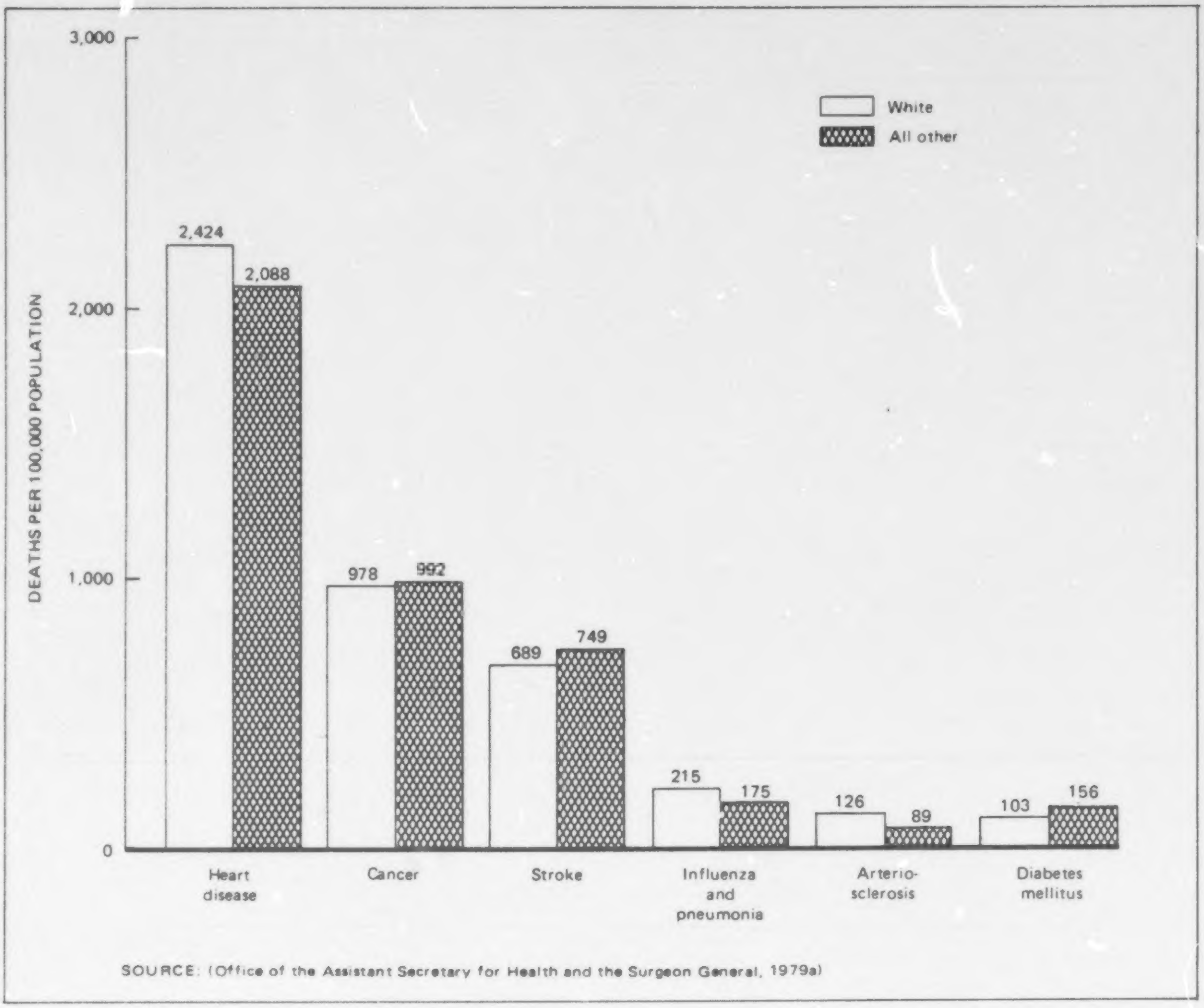
As yet, little is known about the capacity to reduce risks of *heart disease and stroke* among older people. It is encouraging to note that the prevalence of high blood pressure in people 65-74 years of age declined from 49 percent to 41 percent between 1960-62 and 1971-74. Premature deaths from *influenza and pneumococcal pneumonia* can be greatly reduced through the administration of vaccines.

A major challenge to prevention in the older age groups is not just the extension of life but the extension of years of life that can be lived actively with pleasure and with minimal dependency.

The decline in death rates among the younger groups in the population has meant a corresponding increased proportion in the older groups. Today, the 24 million people of 65 years of age and over constitute 11 percent of the population; by the year 2030, they will number 50 million and constitute 17 percent of the population. If the Nation has not by then learned to keep an even greater proportion of the elderly population healthy and independent than is the case today, the drain on resources for medical care will be enormously heavy.

From 1972 through 1977, people in this age group had an average of about 37 days of restricted activity resulting from illness or injury—that is, days when illness or injury restricted their usual activity or confined them to bed—compared with 24 days for people 44-64 years of age. Those in the older age group were confined to bed an average of 14 days out of the year, compared with 8 days for those in the younger age group. At least two-thirds to three-fourths of the days of bed disability result from chronic rather than acute conditions.

The most frequent chronic conditions and impairments for older people are *arthritis,* which affects 44 percent, and *high blood pressure,* which affects 35 percent. *Reduced vision* affects 22 percent, *impaired hearing* 29 percent, and *heart conditions* 20 percent. The prevalence of nutritional deficiencies, depression associated with social isolation, and mental disorientation is not known. However, when individuals are assaulted with constellations of these problems, over



SOURCE: (Office of the Assistant Secretary for Health and the Surgeon General, 1979a)

Figure 11. Major causes of death among persons 65 years of age and over, according to color: United States, 1976

time their resilience and ability to cope can be sufficiently eroded so that they may decline into dependency. A major challenge to prevention is to intervene successfully at various points and at early enough stages to intercept this process. Physical and social risk factors for premature dependency include the following:

- Social isolation.
- Uncorrected sensory impairment.
- Poor nutrition.
- Overmedication.

Detecting the presence and interaction of these risk factors during the course of routine contacts with physicians and other health professionals has long been advocated (Roemer, 1945). Roemer noted that physician examinations of older people should cover all aspects of physical, mental, and social health and should include a review of all drugs being prescribed for and being consumed by the individual. Such systematic attention should provide the basis for plans for corrective actions, directly or through referrals.

Attention to reducing the risk factors for disease and premature dependency is required to meet the Surgeon General's prevention goal for this age group. The object is to improve the health and quality of life and, by 1990, to reduce the average annual number of days of restricted activity by 20 percent, to fewer than 30 days per year.

Summary

A very large variety of health problems beleaguer people; however, the majority of deaths and years of potential life lost, both in the total population and within each major age group, can be attributed to relatively few causes. The major threats are from heart disease, cancer, stroke, accidents and violence, and conditions leading to infant mortality. Ample room exists for reducing risks from all of them. The section to follow shows the extent to which these same health problems are associated with cost of health care and with other societal costs.

SECTION II: The Economic Burden That Prevention Could Reduce

Overview

Measuring the dollar costs associated with failures of disease prevention and health promotion conveys only a partial picture of the full burden on society. The pain and suffering associated with avoidable illness and early death are enormous. These human costs are incalculable. Even the economic costs, that is, the dollars associated with avoidable illness and early death, cannot be calculated with complete accuracy. It is impossible to determine exactly the extent to which disease could be prevented or ameliorated by reducing identified risk factors. The facts are clear for certain conditions, such as cancers of the respiratory tract, spinal cord injuries from motor vehicle accidents, and certain types of birth defects. But for many diseases, most notably heart disease and stroke, it is as yet impossible to predict the extent of reduction in incidence that could be expected to accompany marked reduction in known risk factors. In addition, the methodologies for estimating the costs of disease are at varying stages of development. Nevertheless, given the large share of the Nation's expenditures for health care and for the support of dependent people with major health problems, a review of what is known is in order.

Considerable progress has been made in developing methodologies by which to calculate the economic costs that occur in consequence of illness and death: the dollars spent directly on medical care (direct costs) and the dollars lost from earnings that are forgone by people who are ill or disabled or who die prematurely (indirect costs) (Rice, 1966; Cooper and Rice, 1976; Paringer and Berk, 1977; Smart and Sanders, 1976; Thompson and Mills, 1978). Total cost estimates vary considerably depending on the particular method used, the assumptions made, and the categories of costs included in the calculation. In turn, the choice of method in any instance depends on its suitability for the particular type of problem being addressed and the data that are available with which to address it. For purposes of this report, it is not necessary to compare the various methodologies in detail. Rather, after a general explanation of the way costs are calculated, results of several studies are used to illustrate the general magnitude of the costs associated with conditions that are at least in some part preventable and to show the relative share of these costs that are attributable to each of these disease categories.

The following brief review draws first on analyses performed by the Public Services Laboratory at Georgetown University on 1975 data. These analyses allow for the calculation of the year's costs of morbidity and mortality for all the broad disease categories. The review also draws on a new analysis of cancer costs in the United States for 1977 by the National Center for Health Statistics and on a recently completed 3-year study of motor vehicle accident injuries, cancer, and selected circulatory system disorders conducted for the Insurance Institute of Highway Safety by Policy Analysis, Inc., in Boston. The specific conditions analyzed in these studies together account for a very large share of medical costs and of costs of future earnings forgone resulting from disability or untimely death.

Direct and Indirect Costs of Illness and Death

The same relatively few diseases and conditions that account for a huge proportion of all deaths in the United States also account for a lion's share of the economic burden. To illustrate, in the matter of direct costs for hospital inpatient care alone, diseases of the circulatory system (heart disease and stroke), cancer, accidents, and violence accounted for about 38 percent of the days patients spent in short-stay hospitals in 1977. In actual numbers, they accounted for almost 100 million days and $17.2 billion of hospital care costs. Unfortunately, the costs of physicians' services, drugs, and many other elements of sickness are more difficult to allocate to specific categories of disease. Thus not all studies attempt to estimate them.

The indirect costs of illness and death from diseases and conditions that are in some degree preventable are also staggeringly large. Losses are based on average earnings by age and sex provided by the U.S. Bureau of Labor Statistics, adjusted for wage supplements such as employer contributions for social security insurance, private pensions, and welfare funds. Cross-sectional profiles of average earnings by age for each sex are used to estimate lifetime earnings. In applying these cross-sectional data, it is assumed that the future pattern of earnings for an average individual within a sex group will follow the pattern of differential earnings by age reported by the Bureau of Labor Statistics during the base year. This model recognizes that the average individual's earnings may rise with age and experience.

The use of these average earnings based on cross-sectional surveys would understate the present value of expected lifetime earnings if future economic growth patterns were not taken into account. Thus economists estimate and project an average annual rate of gain in productivity and apply it to the cross-sectional earnings profiles. These estimates of lifetime earnings also take into account varying labor force participation rates. The assumption is that individuals will be working and productive during their expected lifetimes in accordance with the current pattern of labor force participation for their sex and age group.

Using marketplace earnings alone would underestimate the full economic loss resulting from illness among women; thus the value of household work must be added to earnings. Based on a time-motion study of housewives, the relevant market wages for various services performed can be multiplied by the time required for doing that service to obtain an estimate of the cost of replacing the housewife's duties with person-hours from the labor force (Walker and Gauger, 1973). Imputed household values plus marketplace earnings give total earnings, which are used to compute the present value of lifetime earnings.

The arithmetic sum of lifetime earnings and other indirect costs is considered to overstate the current economic value of individuals with a given disease or condition. Thus a discount rate is applied to convert the projected stream of earnings into a figure designed to represent the present value of these earnings. While economists agree on the principle of discounting, controversy surrounds the choice of the particular discount rate to be employed. Customarily, discount rates employed in calculations of the indirect costs of premature death or disability range from a low of 2 percent to a high of 10 percent. The higher the discount rate selected for a calculation, the lower the projected economic cost of a disease will be. The estimates quoted in the following pages are derived from calculations that employ the most conservative rate, 10 percent. Although this method of costing illness and disease admittedly is incomplete, it allows at least some calculation and comparison to be made of the dollar costs of different illnesses.

Costs Attributable to Deaths Occurring in a Single Year

Table A displays data on the direct and indirect costs associated with the prevalence of four major causes of death: diseases of the circulatory system, with heart disease and stroke separately displayed; neoplasms; accidents, poisonings, and violence; and diseases of the respiratory system. Together, in 1975, they amounted to $110.8 billion, or 46 percent of the $238.9 billion total cost of illness in that year.

Of the $118.5 billion of direct costs attributable to the health care of all patients during 1975, 30 percent, or approximately $35.6 billion, was for the care of patients with diseases of the circulatory system, neoplasms, accidents, poisonings, and violence, and diseases of the respiratory systems. Of the $120.4 billion of indirect costs conservatively attributable to premature mortality and morbidity from all diseases and conditions, 62 percent, or $74.6 billion, was for these same major disease categories.

In section I, discussion of challenges to prevention focused on outcomes of poor health expressed in terms of premature death. Table A, however, separates the indirect costs due to illness (morbidity) from those due to death (mortality). As would be expected, the percentage of indirect costs associated with premature death is especially high for heart disease and neoplasms. It is also high for the category accidents, poisonings, and violence—phenomena disproportionately concentrated in younger age groups. The indirect costs associated with deaths from respiratory illnesses are low because mortality, principally from pneumonia and influenza, is concentrated in higher age groups. On the other hand, the direct costs associated with respiratory illness are higher than those from accidents. The difference is accounted for by the large amount of medical care given for short-term respiratory illnesses, many of which are not currently preventable.

The low proportion of indirect costs of morbidity from cancer and other neoplasms reflects the fact that the period of total disability from these conditions is usually short. Nevertheless, in absolute terms, the costs are high. The direct and indirect costs together for 1977 were estimated to total more than $25 billion, of which $5.8 billion was spent for care in short-stay hospitals and $1.6 billion for physicians' services. Table B sets forth these costs according to selected sites of cancer and nonmalignant neoplasms.

Table A. Estimated costs of illness, according to type of cost and major disease category: United States, 1975

Disease category	*All costs*		*Direct costs*	*Indirect costs*		
	Amount in billions	*Percent distribution*		*Total*	*Morbidity*	*Mortality*
				Amount in billions		
Total	$238.9	. . .	$118.5	$120.4	$57.8	$62.5
				Percent distribution		
All diseases	. . .	100.0	100.0	100.0	100.0	100.0
Diseases of the circulatory system	45.7	19.1	13.5	24.7	15.1	33.5
Stroke	6.1	2.5	2.2	2.9	0.6	5.0
Heart and other	39.6	16.6	11.3	21.8	14.5	28.5
All neoplasms	18.9	7.9	4.4	11.3	1.9	20.1
Accidents, poisonings, and violence	27.5	11.5	5.8	17.1	9.8	23.9
Diseases of the respiratory system	18.7	7.8	6.4	9.2	14.8	4.2
All other	128.1	53.6	69.9	37.7	43.3	18.3

NOTE: Discounted at 10 percent. All costs in 1975 dollars.

SOURCE: (Paringer and Berk, 1977)

Table B. Expenditures for and indirect costs of mortality from neoplasms, according to type of neoplasm: United States, 1977

Type of neoplasm	*Expenditures for—*				*Indirect costs of mortality*	
	Short-stay hospital care		*Physician services*			
	Amount in millions	*Percent distribution*	*Amount in millions*	*Percent distribution*	*Amount in millions*	*Percent distribution*
All neoplasms	$5,768.1	100.0	$1,560.7	100.0	$18,543.1	100.0
Malignant						
Respiratory system	632.8	11.0	97.7	6.3	4,764.0	25.7
Skin	125.5	2.2	57.8	3.7	413.5	2.2
Breast	479.6	8.3	105.6	6.8	2,010.7	10.8
Female genital organs	412.7	7.2	92.6	5.9	1,215.1	6.6
Male genital organs	256.8	4.5	64.2	4.1	435.5	2.3
Digestive organs	956.0	16.6	143.0	9.2	4,100.9	22.1
Leukemia	164.2	2.8	29.9	1.9	851.5	4.6
All other	1,591.2	27.6	324.7	20.8	4,480.0	24.2
Benign and unspecified	1,149.4	19.9	645.2	41.3	271.9	1.5

NOTE: Discounted at 10 percent. All costs in 1977 dollars.

SOURCE: Division of Analysis, National Center for Health Statistics.

Cancers of the respiratory organs (trachea, bronchus, and lung) are closely associated with smoking and other identified risk factors and could be preventable to a large degree. As table B shows, these cancers accounted for more than $1 in every $10 spent for hospital care for cancer patients during 1977, at a cost of $633 million. Physicians' services for these cancers cost $98 million. The indirect costs for cancers of the respiratory organs, $4.8 billion, accounted for more than one-quarter of all indirect costs due to cancer. This is largely explained by the high incidence and mortality of lung cancer among men during productive periods of their lives.

Excessive exposure to sunlight has been identified as a risk factor for skin cancer. Direct costs for skin cancer amounted to $126 million for hospital care and $58 million for physicians' services. Indirect costs were $414 million. Fortunately, this form of cancer is slow in growing and is amenable to treatment; thus mortality rates and indirect costs are low.

Occupational and environmental hazards are known to contribute to cancers of the bladder and other sites. However, the extent of the contribution has not been sufficiently determined to permit estimation of the associated costs.

Lifetime Costs of Selected Conditions

Up to this point, the discussion has reviewed the results of studies that focused on the costs due to the *prevalence* of all cases of a particular condition or conditions during a given year. In this approach, the analyst calculates the medical expenses of all cases prevalent in a particular reference year and assigns indirect costs from future earnings forgone due to mortality back to that year. Estimates derived from this method provide a useful overview of costs attributable to various diseases and conditions at any given point in time as well as the relative costs attributable to different conditions at that time.

It is also important to know the lifetime costs associated with the *incidence* of disease, or the cost per new case of disease from onset until cure or death, so that the savings or benefits of preventing a new case of disease can be estimated. Lifetime costs per case are difficult to estimate. They require calculations that take into account the likely course of a disease, the type, volume, and cost of medical care that will be used, the amount of disability and debility, the time between onset and death or cure, and the impact of morbidity and mortality on earnings. These factors vary greatly even within a specific disease category such as cancer, where they will depend on organ site, histological type of cellular change, and stage of disease development when treatment starts. Limitations of data and knowledge preclude the estimation of many of these factors. The incidence method of disease costing, under development for several years by Policy Analysis, Inc., provides estimates of the economic benefits that might be gained in the future by altering the number of new cases that occur. This type of analysis is also useful for looking at the economic consequences to society of the failures to take advantage of known prevention measures.

The conceptual differences between prevalence and incidence cost estimates are clear. Each has advantages for different purposes. But because they measure different aspects of the costs of disease phenomena, the resulting estimates should not be compared. In addition, methods for obtaining both types of estimates rely on less than perfect data and of necessity employ simplifying assumptions. Therefore, they can be relied on to provide only broad estimates of the types of costs they attempt to measure.

Results of Policy Analysis, Inc., studies of the lifetime costs of spinal cord injuries, coronary heart disease, and stroke are summarized in the tables to follow. The 10-percent discount rate is again employed, making the cost estimates most conservative.

Spinal Cord Injuries

Table C displays data on the lifetime costs expected to be generated by the 5,315 people who became the victims of spinal cord injuries in motor vehicle accidents during 1974. These estimates include costs for persons who died immediately or shortly after the accident.

This table displays the items often included in calculating direct medical costs and summarizes the indirect costs associated with the injuries to members of this cohort of people. Direct health costs equal almost $200 million, and indirect costs equal almost $360 million.

Coronary Heart Disease

Table D presents in summary form the estimated lifetime costs of coronary heart disease for those who suffered initial attacks, both fatal and nonfatal, in 1975.

Table C. Estimated lifetime costs of spinal cord injuries, including mortality, related to motor vehicle accidents occurring in 1974, according to type of cost: United States, 1974

Type of cost	*Lifetime costs*
	Amount in millions
Total	$558.7
Direct costs	198.9
Initial hospitalization	69.6
Institutional and attendant care	47.1
Rehospitalization	31.6
Drugs and medical supplies	18.1
Miscellaneous	10.8
Home modifications	9.9
Medical equipment and appliances	6.2
Vocational rehabilitation	3.6
Emergency assistance	2.1
Indirect costs	359.8
Forgone productivity	340.4
Legal and court services	15.6
Insurance administration	3.9

NOTE: Discounted at 10 percent. All costs in 1974 dollars. Estimates based on 5,315 cases, the total occurring in 1974.

SOURCE: (Smart and Sanders, 1976)

Table D. Estimated lifetime costs of coronary heart disease that had onset during 1975, according to sex and type of cost: United States, 1975

Sex	Type of cost		
	Total	Direct	Indirect
	Amount in billions		
Both sexes..	$10.4	$2.2	$8.2
Male	8.4	1.5	6.9
Female	2.0	0.7	1.3

NOTE: Discounted at 10 percent. All costs in 1975 dollars.

SOURCE: (Hartunian, Smart, and Gad, 1978)

Of the $2.2 billion in direct health costs for coronary heart disease, two-thirds can be assigned to men, reflecting lower incidence rates among women than among men in the younger age groups. This lower incidence is also reflected in some of the wide discrepancies between men and women in respect to indirect costs. However, the low monetary value that economists traditionally assign to the housekeeping functions of women are other explanatory factors as well as the lower wages currently characteristic of women in the marketplace.

Stroke

The consequences of stroke are particularly tragic for younger and middle-aged people. Table E displays the estimated lifetime costs attendant on strokes that occurred during 1975 in the population under 65 years of age. Of the $6.6 billion in total costs associated with stroke occurring to young and middle-aged people, a larger share is attributable to men than to women. The difference between their direct health costs is minor; almost all the disparity is explained by difference in indirect costs based on earnings forgone.

Costs Associated With Lifestyle and Environmental Hazards

Alcohol Abuse

One risk factor—alcohol abuse—has been identified with a variety of health problems, including accidents, cirrhosis of the liver, certain types of cancer, and homicide and other forms of violence. Table F displays the proportion of total health expenditures for adults in the United States that can be attributed to alcohol abuse. Treatment of conditions associated with alcohol abuse accounted for $1 of every $5 the Nation spent on hospital care for adults in 1975, with the bill estimated to be $8.4 billion. Other expenditures for treatment of health problems associated with alcohol abuse added another $4.3 billion.

To construct a comprehensive estimate of the societal costs of alcohol abuse is a highly complex task, requiring calculations of projected earnings forgone. In addition, calculations must be made of the costs of economic dependency among the families of alcoholics as well as a share of the costs of the police, courts, and corrections systems, and many other aspects of public spending. The Policy Analysis, Inc., study calculated that the social responses to alcohol abuse cost the Nation about $2.7 billion in 1975. The major components of these costs were extra costs for the social welfare system ($1.3 billion), for fire protection ($392 million), and for the criminal justice system ($930 million). The Alcohol, Drug Abuse, and Mental Health Administration is now studying the costs of alcohol abuse, drug abuse, and mental illness. These illnesses often occur simultaneously, and it is hoped this study will provide estimates of the separate and joint costs of these illnesses.

Table E. Estimated lifetime costs of strokes occuring in 1975 to persons under 65 years of age, according to sex and type of cost: United States, 1975

Sex	Type of cost		
	Total	Direct	Indirect
	Amount in billions		
Both sexes..	$6.6	$1.5	$5.1
Male	4.5	0.9	3.6
Female	2.1	0.6	1.5

NOTE: Discounted at 10 percent. All costs in 1975 dollars.

SOURCE: (Thompson and Mills, 1978)

Cigarette Smoking

Cigarette smoking is the chief cause of lung cancer in the United States and a major contributor to deaths from certain kinds of cancer, heart disease, chronic lung disease, and other diseases. It has been described as the chief preventable cause of death in our society. A number of attempts have been made to assess the costs due to smoking. One recent estimate placed direct health care costs at $8.2 billion in 1976, indirect cost at $19.1 billion, and property loss at $176 million (Luce and Schweitzer, 1978).

Work-Related Injuries and Deaths

The direct and indirect costs of occupational accidents are estimated at $20.7 billion per year. During 1976-77, the number of work-related injuries increased from 5.0 million to 5.3 million and the number of workdays lost increased from 32.5 to 35.2 million.

Table F. Estimated national health expenditures due to alcohol abuse among persons 16 years of age and over, according to type of expenditure: United States, 1975

Type of health expenditure	*All health expenditures*	*Expenditures due to alcohol abuse*	*Expenditures due to alcohol abuse as percent of total expenditure*
	Amount in billions		*Percent*
Total	$105.6	$12.7	12.1
Hospital care	42.3	8.4	19.9
All other	63.3	4.3	6.8

SOURCE: (Berry et al., 1977)

Air Pollution

Although there are few national estimates of the health cost of air pollution, Lave and Seskin (1977) estimated that costs of health effects of air pollution in 1970 totaled $4.3 billion. Current gaps in our knowledge of the cost and health effects of environmental hazards will be partly overcome by fulfillment of the mandates of the Health Services Research, Health Statistics, and Health Care Technology Act of 1978 (Public Law 95-623). This law requires that an ongoing study of the costs of the health effects of all environmental hazards resulting from human activity be jointly conducted by the Secretary of the Department of Health and Human Services and the Institute of Medicine of the National Academy of Sciences.

Summary

In summary, a very large portion of our national health expenditures is spent on the direct health care costs of conditions for which prevention is to some degree possible. The Nation also bears a heavy burden of indirect costs from such conditions. If preventive actions were successful in cutting direct and indirect cost expenditures by only 10 percent, reductions would still equal billions of dollars. The amount of net savings would, of course, depend on the initial cost of investments in prevention, their rate of return, and the continued cost of prevention maintenance over time.

SECTION III: Successes, Failures, and Gaps in Prevention and Control

Overview

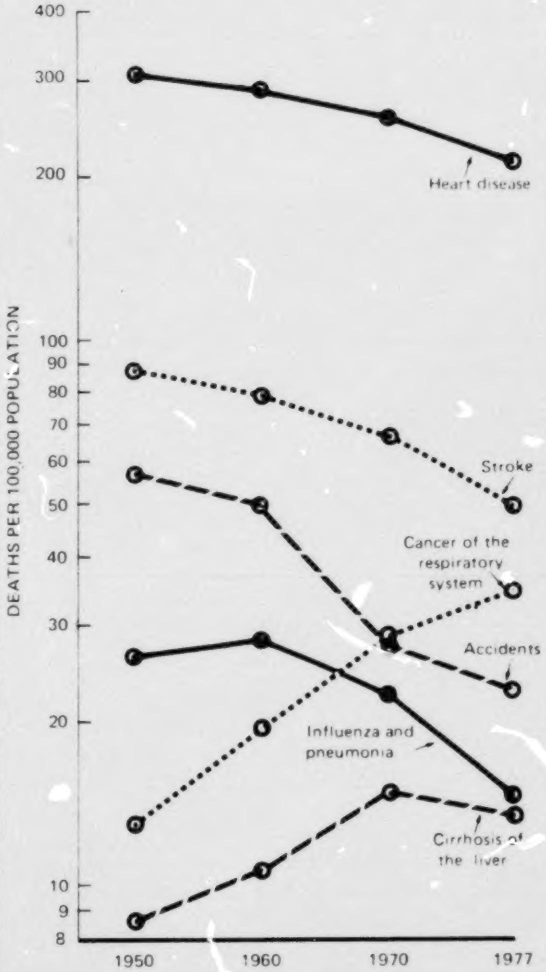
This section presents recent trends in death rates for conditions where prevention is possible to varying degrees. It then reviews what people perceive to be threats to their health, what they believe they individually should and can do to promote their health by changing elements of their lifestyle, and what they actually have done or have left undone in these respects. Much of the information on attitudes and behavior change is derived from surveys conducted in 1978 by Louis Harris and Associates, Inc.; Yankelovich, Skelly, and White; and the National Survey of Personal Health Practices and Health Consequences, conducted among adults 20-64 years of age by the National Center for Health Statistics (NCHS) during 1979.

Data from a variety of sources are then presented that reflect achievements and gaps in people's use of preventive health services, including early detection and treatment of disease, and in reduction of risks of violent death. Unfortunately, absence of data makes it impossible to report similar analysis of achievements and gaps in efforts to reduce risks from hazards in the environment.

Recent, Encouraging Trends in Death Rates

During the 1950's, the age-adjusted death rates for most of the leading causes remained at fairly steady levels. As data in figure 12 show, death rates for heart disease, stroke, and accidents declined slightly, and those for influenza and pneumonia increased slightly. However, cancers of the respiratory system increased by about 50 percent during the period, and cirrhosis of the liver increased about 25 percent.

During the 1960's, the rates for heart disease, stroke, and influenza and pneumonia declined and accident rates fell markedly. In contrast to these favorable trends, death rates for cancers of the



SOURCE: National Center for Health Statistics: Computed by Division of Analysis from data compiled by Division of Vital Statistics.

Figure 12. Age-adjusted rates for selected causes of death: United States, selected years 1950-77

respiratory system and cirrhosis of the liver continued to increase sharply.

The early years of the 1970's have been ones of great progress. Heart disease mortality decreased by about the same amount during the first 7 years of this decade (17 percent) as it did during the 20-year period from 1950 to 1970. Other notable reductions during the 1970's were as follows: 27 percent for stroke; 18 percent for accidents; and 36 percent for influenza and pneumonia. The 1970's also witnessed a decline of 11 percent in cirrhosis deaths, following the long period of increasing rates.

Total cancer mortality, not shown in figure 12, has decreased for the population under 45 years of age and has recently begun to decline for those 45-49 years of age. However, the rate for lung and other cancers of the respiratory system has continued to rise precipitously. The death rate for these cancers among men exceeds those for any other cancer site. While the rate has been lower among women, by 1983 it is expected to exceed that from breast cancer, the current leading cause of cancer deaths among women.

No simple explanations exist for the encouraging direction of most of these trends. As with the past conquests of the communicable diseases, many factors are responsible. For example, improved death rates for heart disease undoubtedly reflect some combination of reduction of risk factors in the population (due in large part to education by the media and schools and at the worksite), better emergency medical services, better technology of medical care, and more attention to rehabilitation. On the other hand, the rise in death rates for cancers of the respiratory system does reflect increased exposure to risks.

People's Attitudes Toward Health

A recent survey by Harris (1978) indicates that more than 50 percent of Americans are much more concerned about preventive health than they were a few years ago. This new concern with prevention is especially evident among leadership groups. In 1978, about three-fourths of business executives and union officials surveyed by Harris stated that the top management of their organizations were more concerned with preventive health today than they were 5 years previously. About 80-90 percent of the same group stated that our health system should give more emphasis to preventive medicine and less to curative; among the general public, 42 percent responded in this way (Harris, 1978).

The extent to which people actively pursue change in the interest of promoting or preserving health is a function of what factors they perceive as important to change and how difficult they find it to accomplish the particular change. The diseases and conditions Americans most greatly fear are cancer, heart, and accidents.

Americans today perceive that the principal threats to health arise from both environmental and lifestyle hazards. Out of a list of 30 possible health threats, those identified most often in 1978 were as follows (Yankelovich, Skelly, and White, 1979):

Possible threats	*Percent*
Industrial waste	59
Pollution	58
Marijuana	58
Cigarettes	55
Crash diets	55
Diet pills	52
Overweight	52
Pesticides	47
Tranquilizers	43
Cholesterol	42
Liquor	41
Nuclear power plants	40

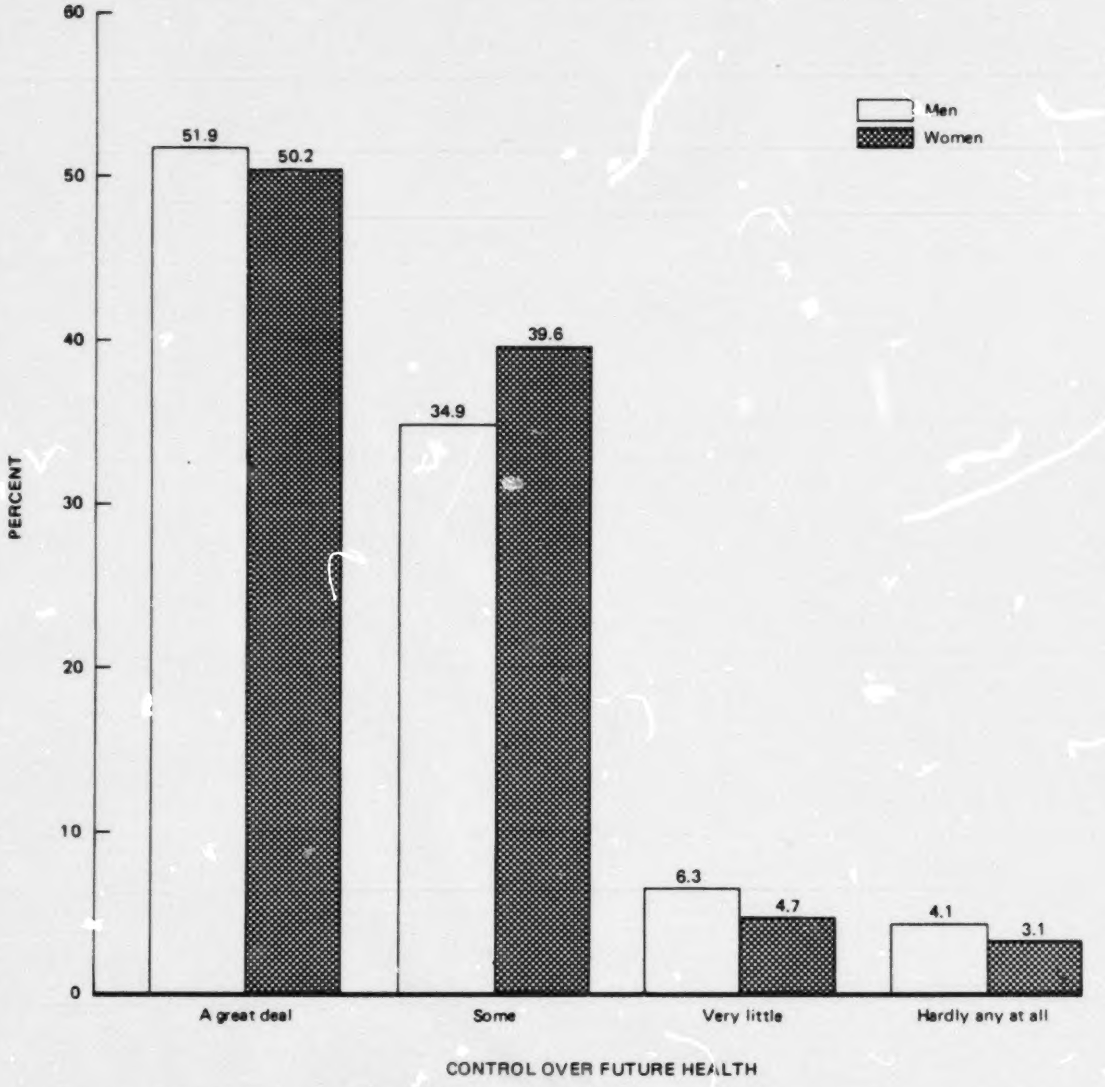
Most major risk factors are included in these 12 possible threats to health but not necessarily in the order of importance suggested by current evidence.

Another way of learning what people perceive as important to promoting good health is to ask them what they would like to do to set a good health example for their families. Adults replied to this question on the Yankelovich survey, as follows:

Good health habits	*Percent*
Stop smoking	29
Exercise regularly each week	19
Stay calm, not lose their tempers	18
Lose weight	15
Cut back on sweets	13
Eat more balanced diets	12

Other respones—each 9 percent—included going for physical checkups, not putting off going to the doctor, and being more cheerful. Contrary to demonstrated evidence, people did not perceive the use of seat belts while driving to be important.

Do people believe that good health is a matter of luck or fate? Or do they believe that it is a matter over which they have some control? The data in figure 13 show that about half the population believes that the individual has "a great deal" of control and that only about 10 percent believes that the individual has "very little" or "none at all." About 60 percent of adult family members surveyed by Yankelovich believed that being healthy requires that the individual work at it and take a preventive approach to health care; the rest took good health for granted and dealt with health problems on a crisis basis (Yankelovich, Skelly, and White, 1979). When



SOURCE: Division of Analysis, National Center for Health Statistics: Data from the National Survey of Personal Health Practices and Health Consequences.

Figure 13. "How much control do you think you have over your future health?" Responses by adults 20-64 years of age, United States, 1979

directly questioned, however, 92 percent agreed with the statement, "If we Americans ate more nutritious food, smoked less, maintained our proper weight, and exercised regularly, it would do more to improve our health than anything doctors and medicine could do for us" (Harris, 1978).

Most people try to change lifestyles on their own, but many look to health education programs for information and specific skills. According to a survey conducted in nine cities during 1977-78, urban Americans are interested in health information and education programs (American Hospital Association, 1978). Although 62 percent of the respondents were unaware of the existence of any such programs in their communities, close to half who knew about a program reported that they had participated in it (American Hospital Association, 1978). The most frequently mentioned programs were for cardiopulmonary resuscitation (9 percent) and first aid (6 percent). Forty-two percent of the respondents who knew about a health education program learned about it from the media, 16 percent from a friend or relative, and only 6 percent from their personal physicians. Asked what types of programs would be of most interest, respondents rated stress reduction and home accident programs highest.

According to the Yankelovich survey, 46 percent of American adults reported recently changing the lifestyles of themselves and their families in the interest of good health (1979). Furthermore, a surprising 70 percent of adults reported that following a good health routine is easy, "It just requires willingness and determination." Only 30 percent reported, "It takes too much dedication and discipline."

In summary, people appear to recognize that smoking, overweight, risky driving, stress, alcohol abuse, and lack of physical exercise are potential threats to their health that they can control.

Lifestyle Characteristics and Attempts at Change

People appear to be reducing certain potentially harmful personal habits rather than increasing them. As data in figure 14 show, trends are toward fewer smokers, lower per capita consumption of tobacco and high cholesterol foods, reduced cholesterol levels, lower rates of untreated hypertensives, and a marked increase in the percent of adults who regularly exercise. The percent of adults who are heavy drinkers has not changed in recent years. The only increasing trend was in smoking among teenage girls, although the most recent data indicate no further increase. While the overall picture is encouraging, there is potential for far greater reductions in many of these risk factors than has been achieved so far. Some changes in particular lifestyle characteristics deserve further note.

Smoking

No single measure would lengthen the life or improve the health of Americans more than eliminating cigarette smoking (Richmond, 1980). The per capita consumption of tobacco has declined steadily since 1973, and it is now at the lowest level of the century. Today there are over 30 million exsmokers. The percent of all adults who smoked regularly was 33 percent in 1979, the lowest in more than 30 years. The rates of smoking among adult men declined from 53 percent to 38 percent during 1965-79, and it has been declining among teenage males since 1970 and among teenage females since 1974 (National Institute of Education, 1979).

In the past, adult women smoked at far lower rates than men, which was reflected in their far lower death rates from lung cancer. Women did not begin smoking in significant numbers until World War II. However, the proportion of adult women who smoke has been declining. Because of the long latency period for lung and other cancers of the respiratory system and for chronic obstructive lung disease, the outcomes in death rates, which rose so precipitously for men during the 1960's and early 1970's, are only now beginning a similar rise among women. On the other hand, smoking rates among men began to decrease about 10 years ago, and within the past few years the increases in the death rates for cancers related to smoking have begun to slow down.

Smoking is a notoriously difficult habit to break; often many attempts must be made before success is attained. In 1979, 53 percent of women smokers and 45 percent of men smokers reported that they had made a serious attempt to stop smoking during the previous 2-year period (NCHS, 1979a).

Overweight

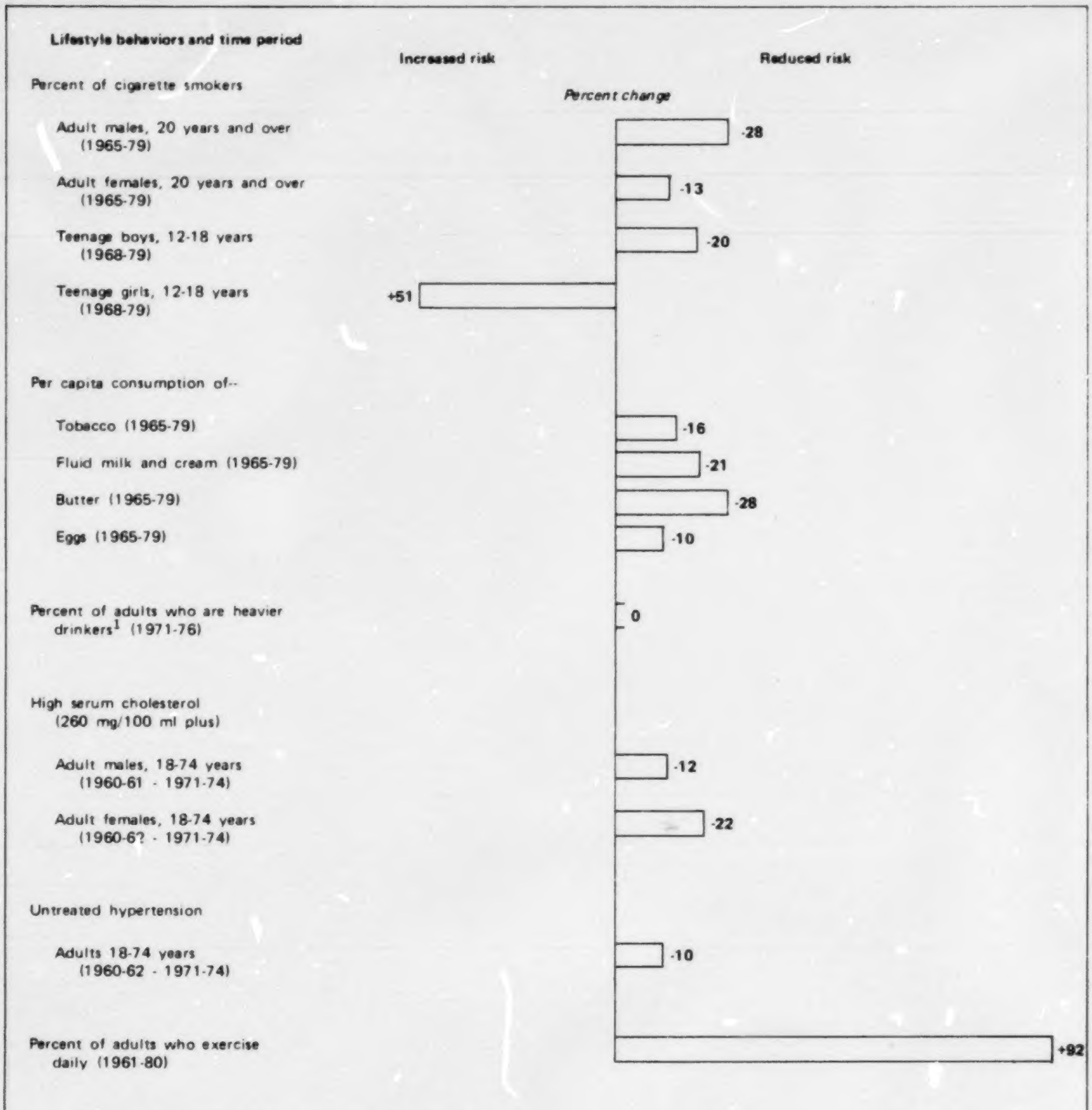
During the last 80 years, the mean body weight of the total U.S. population has steadily increased. For people 20-74 years of age, 14 percent of men and 24 percent of women are significantly overweight, that is, they are more than 120 percent of desirable weight for their height and sex. There is little difference between the rates of significant overweight between black men and white men, but black women are about a third more likely to be overweight than white women. Forty-six percent of American adults perceive themselves to be overweight. However, only a third of all adults actually know the recommended weight for their own height and age.

The United States appears to be a nation of dieters. According to the Harris survey of 1978, 16 percent of all adults stated that they were currently on a diet, and another 31 percent reported that they had dieted in the past. On the other hand, 53 percent had never dieted, and among this group, 44 percent were to some extent overweight (Harris, 1978). According to another recent survey, 1 out of every 4 adults said they were watching their calorie intake more carefully than in 1977 (Yankelovich, 1979).

Nutrition Consciousness

Americans appear to be increasingly concerned not only about the amount of food they eat but also about its content. In 1978, 1 of every 4 adults reported that they were eating more nutritious food than they ate in 1977 (Yankelovich, 1979). For clues as to dietary practices and foods that are presently being avoided, the same survey indicated that more than 80 percent of the adult population believed that cholesterol and fat posed a great degree or some degree of threat to health. About 70 percent thought that salt posed some threat.

The increasing consumer attention to diet is undoubtedly responsible for the fact that mean serum cholesterol levels in the U.S. population dropped about 12 percent for men and 22 percent for women between the early 1960's and early 1970's.



[1] 2 or more drinks per day or 14 or more drinks per week.

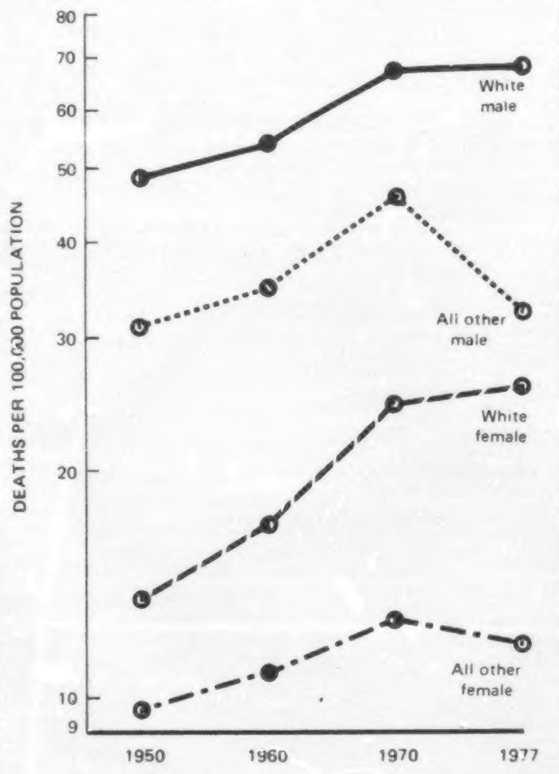
SOURCE: Compiled by Division of Analysis, National Center for Health Statistics.

Figure 14. Trends in lifestyle behaviors that affect health

Risky Driving

At the other extreme, only a small percent of Americans take active steps to reduce risks to themselves and their children from the hazards of death and disability from car crashes. Although all newer models of automobiles are equipped with seat belts, only 20 percent of the driving population uses them. A 1974 survey by the Insurance Institute for Highway Safety found proper child safety restraints in use for only 7 percent of the almost 9,000 automobile passengers under 10 years of age included in the survey (Williams and Zador, 1977).

To an unknown extent, teenagers continue to combine drinking and driving. The motor vehicle accident death rates for people 15-19 years of age show marked discrepancies between youths of different sexes and colors. As the data in figure 15 indicate, other than white youth of both sexes had less than half the rates of death of white youth. The lower proportion of deaths among other than white youth may be explained by less easy access to cars in inner cities; the lower proportion of deaths among females may be due to their generally lower propensity to alcohol abuse and risk-taking behavior.



SOURCE: National Center for Health Statistics: Computed by Division of Analysis from data compiled by Division of Vital Statistics.

Figure 15. Death rates for motor vehicle accidents among persons 15-19 years of age, according to color and sex: United States, selected years 1950-77

Stress and Hazards on the Job

The extent to which stress at work may contribute to poor health is only beginning to be explored systematically. Preliminary evidence indicates that inappropriately managed stress is linked to increased risks of heart disease and stroke. More than 1 in 4 men who work report that they are under a great deal of emotional stress from their jobs; about 1 in 3 women report the same (NCHS, 1979a). Another large proportion, 50 percent of men and 45 percent of women, report that they are under some stress.

No national surveys have reported the types of environmental hazards that American workers believe they are exposed to in their work environment and the degree of risk to which they are exposed. However, in 1979, 12 of every 100 male workers reported that at some point in their lives they had changed jobs because of concerns about occupational hazards or dangers to their health. Among women, the rate was only half as great (NCHS, 1979a).

Misuse of Alcohol and Drugs

An estimated 10 percent of the adult population have drinking problems, and 16 percent of all adults report that they or someone in their family drinks more than they should (National Institute on Alcohol Abuse and Alcoholism, 1978; Harris, 1978). Among survey respondents reporting excessive drinking in their families, only 19 percent thought that the person concerned had ever gone to a friend, a relative, or a professional of any kind for advice or help. In about a quarter of the families reporting alcohol problems, drinking had interfered with the person's job, with higher rates being reported among high income and low income families (Harris, 1978).

Only a small proportion of people, approximately 7 percent of males and 5 percent of females, stated that they had changed their drinking patterns during the past 2 years because of health (NCHS, 1979a). These findings are consistent with the results of other national surveys and with beverage sales data, which show that per capita consumption of absolute alcohol did not change markedly during 1971-78. Data from other surveys show that among adolescents there has been no change in peak quantity (five or more beers at a time) consumed or in regularity of drinking during 1974-78.

Heroin-related medical problems declined dramatically from 1976 to 1978, and barbituate-related mortality declined from more than 2,600 in 1970 to less than 1,300 in 1976. On the other hand, the proportion of adolescents reporting current use of marijuana has been rising continuously over the last decade, increasing from 12 percent in 1974 to 16 percent in 1977.

Exercise and Fitness

Survey data about the amount of exercise people regularly get may understate the true case because a sizable proportion of the population engages in physical activity on the job. Twenty-four percent of men, but only 10 percent of women, report a great deal of physical activity at work. Another 26 percent of men and 18 percent of women report some job-related physical activity (NCHS, 1979a).

Addressing the question of nonwork-related exercise, the 1978 Yankelovich survey found that adult family members fall into two distinct groups: 36 percent, more than 1 in 3 adult family members, get some planned physical exercise at least several times a week; the remaining 64 percent exercise only occasionally or pay no attention to fitness at all. Despite the increased attention paid to running and to physical fitness in general, this survey found that family members who were exercising more than they did a year previously, 24 percent, barely outnumbered those who exercised less, 21 percent (Yankelovich, 1979).

Those who exercise regularly are almost equally divided between men and women. They tend to be more concentrated among people 18-34 years of age and those 65 years of age and over. Among this older group of the population, a surprising 39 percent reported engaging in regular exercise (Yankelovich, 1979).

The 1978 Harris survey found that more affluent people are more likely to engage in regular exercise. Only 24 percent of adults in households with an income of less than $7,000 a year reported exercising. The percent rose to 56 in households earning $25,000 a year or more; among business leaders, it was a startling 75 percent (Harris, 1978).

Social Supports

Recent studies indicate that single people who live isolated, friendless lives are at a significantly greater risk of ill health and death than are people with a close network of relatives and friends whom they see often or than are people who actively engage in community activities. In fact, the absence of such social support systems appears to constitute just as strong a risk factor for premature death as do the factors of diet, exercise, and the absence of other more widely recognized attributes of healthy lifestyle (Berkman and Syme, 1979).

The 1979 NCHS survey found that about 6 percent of the population visited with friends or relatives less frequently than once a month, and men and women were the same in this respect. On the other hand, about 70 percent of the population visited with close friends and/or relatives once a week or more frequently. Thus, although social isolation is a problem for a small segment of the population, it does not appear to be so for the majority.

Use of Preventive Services

The effectiveness of certain health services in detecting disease at controllable stages, as well as in preventing undesired pregnancies, unnecessarily high rates of infant deaths, and illness and deaths from many communicable diseases is well established. However, Americans avail themselves of all these services at uneven rates.

Regular Physical Examination

Americans appear to have adopted the idea that the regular physical examination is an important and worthwhile investment, even though they do not like it. The 1979 NCHS survey of health practices reports that 59 percent of men and 70 percent of women had had physical examinations (although the completeness of these examinations is not known) within the 2 years prior to the survey. This is despite the Yankelovich survey report that 43 percent of the population found such examinations frightening, "because you never know what you will find out," and that 73 percent of the adult population believed that checkups cost too much for the average family to afford. The 1979 NCHS survey also ascertained the recency with which certain tests had been performed, either during the course of physical examinations or in the course of visits to physicians for other purposes.

High Blood Pressure

Hypertension, or high blood pressure, is a major risk factor for heart disease as well as an important factor in other life-threatening diseases, such as kidney failure, stroke, and congestive heart failure. The National Heart, Lung, and Blood Institute (NHLBI) estimates that about 60 million people have elevated blood pressures (more than 140 mmHg/90 mmHg) and are at increased risk. Of these, about 35 million people, or about 15 percent of the population, have definite hypertension (160 mmHg/95 mmHg). These people are prime targets for control efforts that can include medication, weight loss, and modification of habitual diet to reduce salt consumption. Black adults have higher rates of high blood pressure than white adults, 28 percent versus 17 percent (NCHS, 1980a).

In recent years, education programs about high blood pressure and wider availability of blood pressure screening have been encouraging the public to get blood pressure checks regularly. The 1979 health practices survey found that 75 percent of men and 83 percent of women 20-64 years of age had had their blood pressures checked within the past year. The picture looks even better considering that 88 percent of men and 94 percent of women had had readings within the past 2 years.

Control of high blood pressure, once detected, poses special problems of patient cooperation in maintaining a regime of recommended treatment over time. Continuity of medical care is often absent. Moreover, the condition of hypertension is symptomless, but medications for its control sometimes have side effects. Control measures must be continued over the entire lifetime. Findings of the NHLBI Hypertension Detection and Follow-up Program indicate that the systematic management of hypertension has a great potential for reducing mortality for large numbers of people with high blood pressure, including those with "mild" hypertension.

Breast Examination for Cancer

Breast cancer is still the leading cause of cancer deaths among women. No known primary preventive measures exist, but early detection and prompt treatment can greatly increase chances for survival. Screening for breast cancer can take many forms, including physician examination, diagnostic tests such as mammography or ultrasound, and self-examination.

The 1979 NCHS survey reports that 62.5 percent of women 20-64 years of age had had a breast examination by a physician within the previous year and that an additional 20 percent had been examined within the previous 2 years. Only 5 percent of women reported never having had such an examination. This represents a welcome contrast to findings from a 1973 NCHS survey where the estimate was 12 percent for women 24-64 years of age (NCHS, 1977). Mammography is not recommended as a routine procedure for early detection among women under 50 years of age. No national data report how many women conduct monthly self-examinations of their breasts, which is recommended by the American Cancer Society.

Pap Smear

Most deaths from cervical cancer can be eliminated. Success depends on early diagnosis and treatment.

Almost 60 percent of American women 20-64 years of age reported having had a Pap smear for the detection of cervical cancer within the year previous to the 1979 NCHS survey. Another 20 percent had had the test within the previous 2 years. Only about 6 percent reported not ever having had or not knowing if they had had the test. Again, this represents a large positive shift from the 1973 NCHS survey, when 12 percent reported never having been tested (NCHS, 1977).

Mortality from cervical cancer among women 45-49 years of age decreased by half during the period 1968-77. However, as figure 16 shows, although the death rate for other than white women fell at about the same rate that it did for white women, the rate for other than white women is still approximately three times higher.

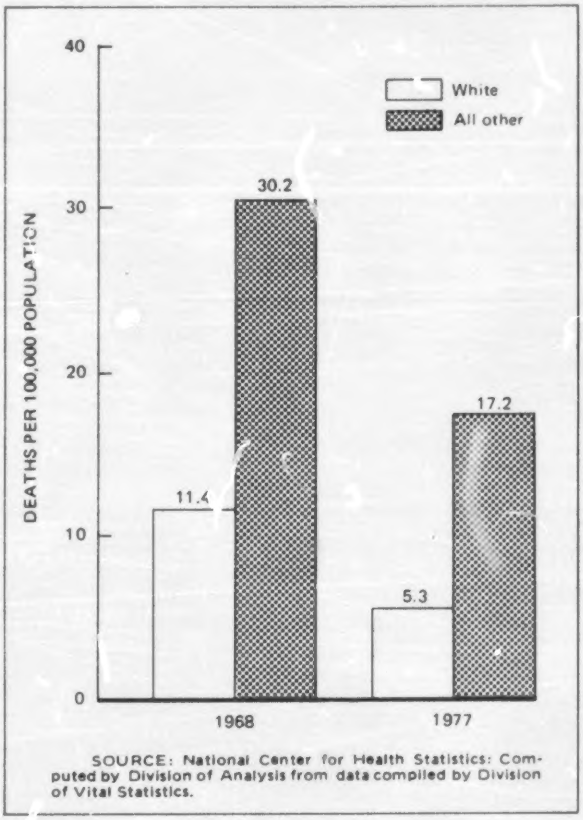
Other Diagnostic Tests

Overall, wide differences exist in the rates at which people avail themselves of health services designed to permit early diagnosis and treatment. Furthermore, for any given type of service, there may be substantial differences in rates between men and women, between whites and those other than white, and between those who live in cities and those who live in rural areas.

The data in figure 17 indicate differences in diagnostic testing between populations in urban counties of the United States and those in rural, medically underserved areas in 197[illegible]. The extent to which tests are sought may be greater today, but the relative differences in the proportions of people living in these areas who have never had tests for early detection of disease may not be very different. As can be seen, the proportion of adults who had never had an eye examination was twice as great in medically underserved areas as in metropolitan counties. In addition, people in metropolitan counties were also much more likely to have had glaucoma and Pap tests and breast examinations.

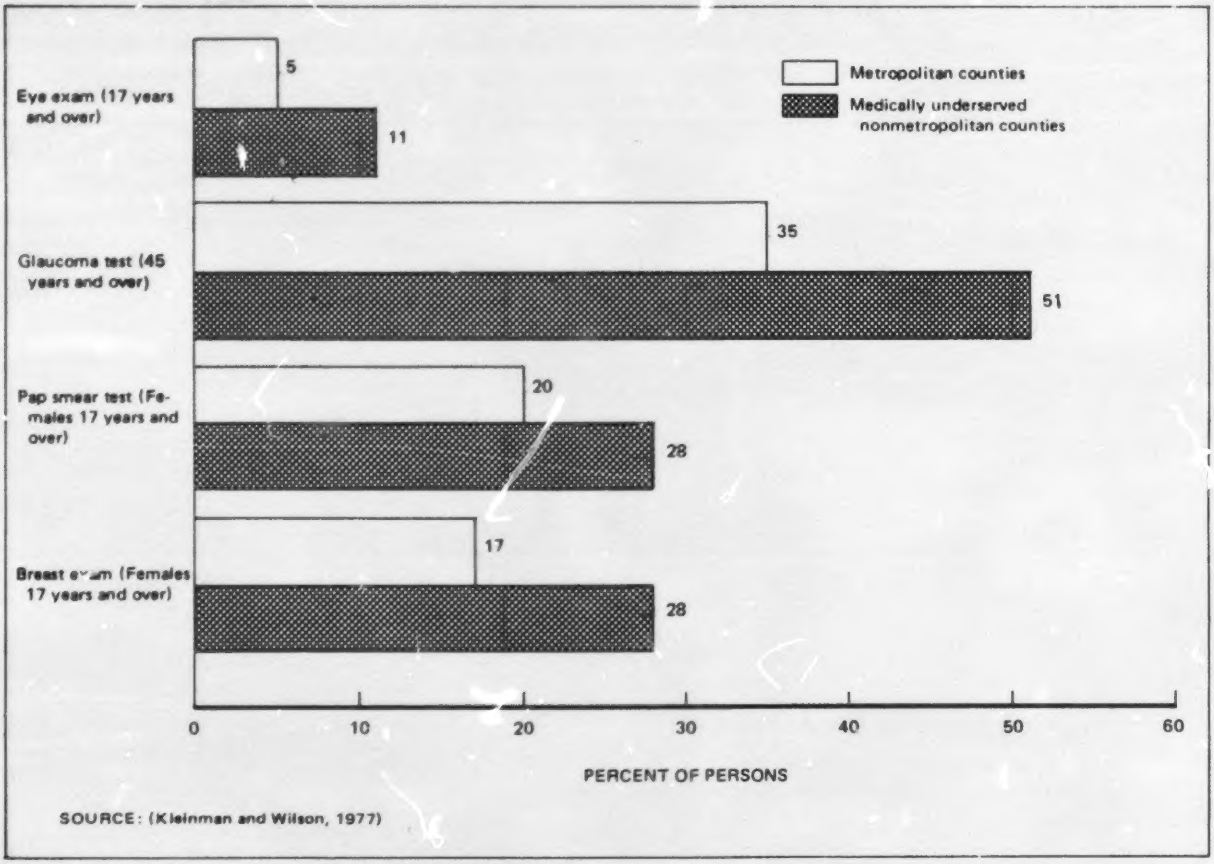
Family Planning

Family planning is a preventive health measure that enables individuals to make and to implement their own decisions regarding reproduction. Family planning supports maternal and infant health and the



SOURCE: National Center for Health Statistics: Computed by Division of Analysis from data compiled by Division of Vital Statistics.

Figure 16. Death rates for cervical cancer among females 45-49 years of age, according to color: United States, 1968 and 1977



SOURCE: (Kleinman and Wilson, 1977)

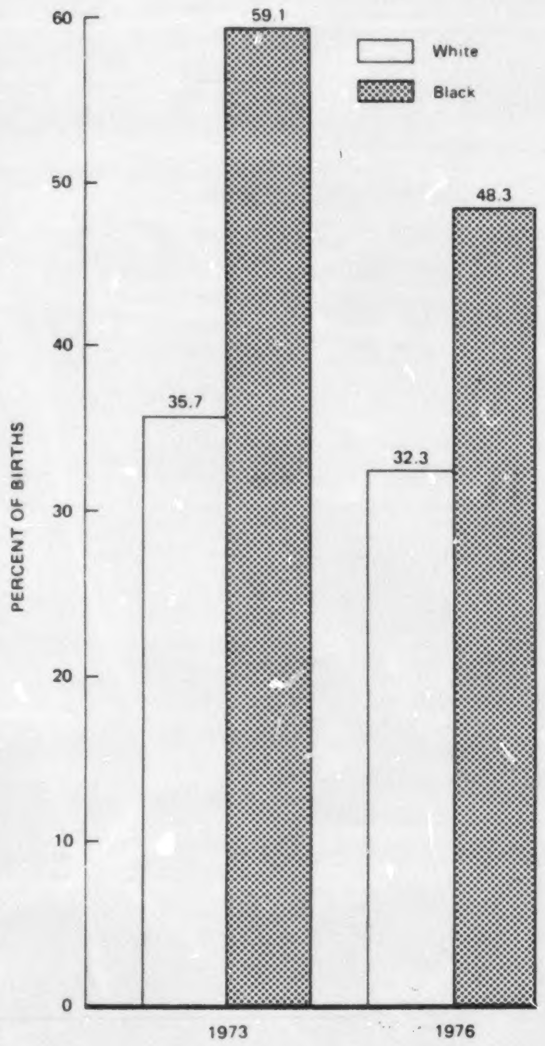
Figure 17. Percent of population never receiving diagnostic testing, according to type of test, specified age group, and location of residence: United States, 1973

emotional and social health of the family. Pregnancies among teenagers, unmarried women, women over 34 years of age, and women who have already borne many children are all associated with higher than average rates of maternal and/or infant morbidity and death. These pregnancies are also more likely than other pregnancies to be unwanted or mistimed. Children whose births were intended by their parents are less likely than children whose births were not intended to suffer parental neglect and emotional deprivation. Unplanned births impose psychological and social costs that often continue throughout the lifetimes of both the parents and the child.

The use of contraceptives has grown significantly. As of 1976, only 14 percent of married women at risk of an unplanned pregnancy were not using some form of contraception. Nevertheless, disparities between groups in the effective use of family planning methods remain. For one example, 11 percent of babies born to ever married American women between 1971 and 1976 resulted from pregnancies that were not wanted prior to conception, and an additional 23 percent resulted from pregnancies that the mothers felt occurred too early in their lives, resulting in a total of 34 percent unplanned births to ever married women. However, as figure 18 shows, the proportion of unplanned births has been decreasing. The figure also shows that the rate of unplanned births for black women was much higher than for white women at both points in time; but the differences are decreasing.

Another gap in family planning is evidenced by the higher proportion of unplanned births that occur among ever married women who are poor. As data in figure 19 show, the rate of recent unplanned pregnancies among women with family incomes below 150 percent of the poverty index during 1971-76 was about 50 percent more than that among women with higher family incomes (150 percent and above). Almost half of the babies born to women whose family incomes were less than 150 percent of the poverty index were unplanned.

In 1977, 500,000 babies were born to single women, half of whom were teenagers. Teenage pregnancy usually reflects lack of family planning. The data in table G indicate that the rate of births to girls 10-14 years of age actually rose slightly between 1950 and 1977. In addition, the differences according to race for this age group was sevenfold in 1977. Among women 15-19 years of age, a steady drop in birth rates is evident for both races between 1950 and 1977. However, less than one-third of the births

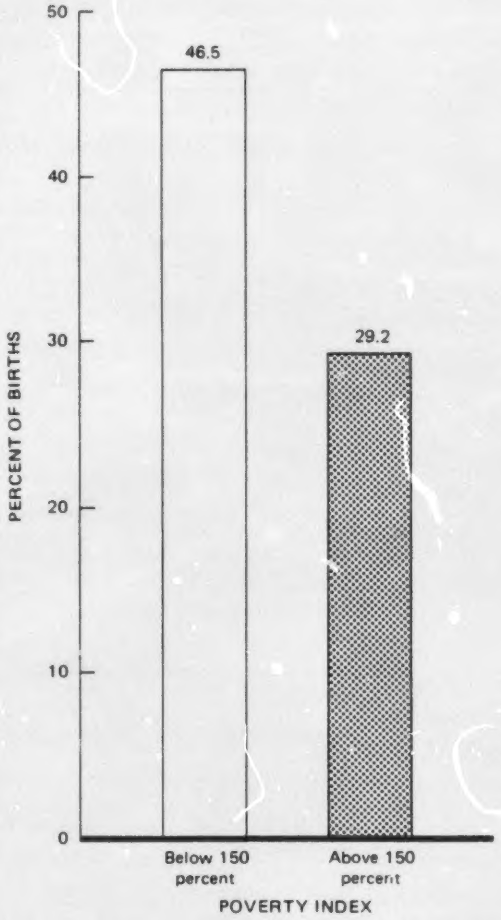


SOURCE: Division of Vital Statistics, National Center for Health Statistics: Data from the National Survey of Family Growth.

Figure 18. Unplanned births during 5 years prior to interview to ever married women 15-44 years of age, according to race: United States, 1973 and 1976

to these young women were wanted when they occurred. At the same time, 25 percent of sexually active, unmarried women in this age group reported that they never used contraceptives, and about 45 percent stated that they used them only occasionally.

The number of abortions in the United States, 1.37 million during 1978, also indicates the lack of contraceptive practice by large numbers of women who at any one time wish to postpone or avoid childbearing. About 1 out of every 8 women of childbearing age in the United States has had an abortion. Of the abortions performed in 1978, one-third were obtained by teenagers, three-fourths of whom were unmarried.



SOURCE: Division of Vital Statistics, National Center for Health Statistics: Data from the National Survey of Family Growth.

Figure 19. Unplanned births during 5 years prior to interview to ever married women 15-44 years of age, according to poverty index: United States, 1976

Care During Pregnancy

Although overall infant and maternal mortality rates have fallen continuously since 1950, there are striking demographic variations both in these rates and in the prevalence of some of the major risk factors for poor pregnancy outcomes.

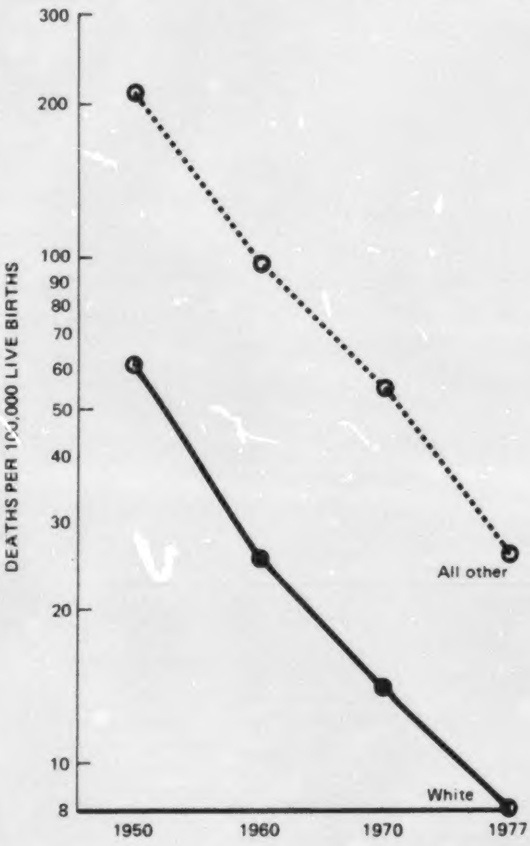
The disparity between maternal mortality rates according to color, while considerably less than in 1950 and 1960, is still marked (figure 20). The 1976 rate of maternal death for those other than white was three times that of the rate for whites. It was at the level where white maternal mortality had been in 1960, 16 years earlier.

The overall infant mortality rate has been reduced by more than half since 1950, falling from 29.2 to 13.8 per 1,000 live births in 1978. However, the rate for black infants, 23.6 per 1,000 live births, was only at the 1955 level of the rate for white infants. A twofold difference between black and white infant deaths

Table G. Birth rates for teenagers, according to age and race: United States, selected years 1950-77

Year	10-14 years			15-19 years		
	Total	White	Black	Total	White	Black
	Live births per 1,000 teenage women					
1950	1.0	0.4	---	81.6	70.0	---
1960	0.8	0.4	4.3	89.1	79.4	156.1
1970	1.2	0.5	5.2	68.3	57.4	147.7
1977	1.2	0.6	4.7	53.7	44.6	107.3

SOURCE: Division of Vital Statistics, National Center for Health Statistics.



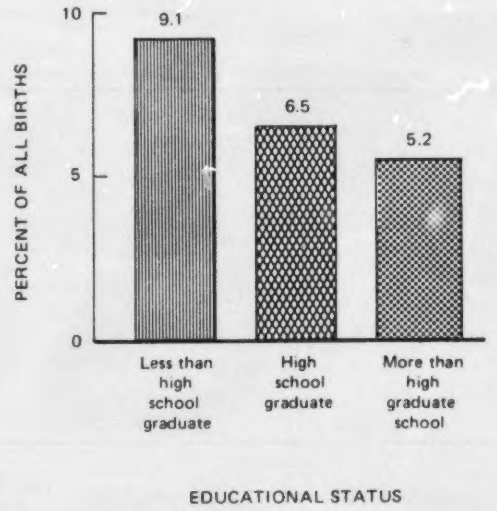
SOURCE: National Center for Health Statistics: Computed by Division of Analysis from data compiled by Division of Vital Statistics.

Figure 20. Maternal mortality rates, according to color: United States, selected years 1950-77

is maintained whether one measures total infant mortality, neonatal mortality, or post neonatal mortality.

These discrepancies reflect differences in risk factors, in combinations not yet well understood. The much higher rate of births among black teenage women has already been noted. Black women have twice the incidence of low birth weight babies. The median number of visits for prenatal care among black women is 9.4, compared with 11.2 for white women.

Figure 21 shows that low birth weight babies are much more apt to be born to women of low than of high educational attainment. Women who have not completed high school have almost twice the risk of having low birth weight babies as do women with education beyond high school. This measure is directly related to the teenage pregnancy measure previously cited, since young teenage mothers are not likely to complete high school. Data are not available to show the differentials in rates of smoking, alcohol consumption, inadequate nutrition, and



SOURCE: National Center for Health Statistics: Computed by Division of Analysis from data compiled by Division of Vital Statistics.

Figure 21. Infants with low birth weight (2,500 grams or less), according to educational status of mothers 20 years of age and over: United States, 1978

poverty status among pregnant women of different age and race or color groups. All these factors are associated with low birth weight.

The association of low birth weight with age of the mother is established: 15 percent of babies born to mothers under 15 years of age are low birth weight, twice the level for all babies. Unfortunately, while teenagers and their babies are at greatest risk of unfavorable pregnancy outcomes, these young women are also the least likely to seek or obtain prenatal care or to seek it early in pregnancy. In 1977, 26 percent of women giving birth made no prenatal visit during the first trimester of pregnancy; among mothers under 15 years of age, the figure was 68 percent. Six percent of women giving birth in that year had had no prenatal care during either of the first two trimesters; among mothers under 15 years of age, the figure was 21 percent.

Immunization

Immunizations from poliomyelitis, mumps, tetanus, diphtheria, rubella, pertussis (whooping cough), and measles have long been available to protect children, and vaccines for certain strains of influenza and pneumococcal pneumonia have been developed more recently to protect adults. Maintaining such protection requires continual vigilance. During the early 1970's, immunization levels among children began falling, so that by 1976 more than a third of all children under 15 years of age were not properly protected. This was accompanied by a 63-percent rise in the number of rubella cases, a 39-percent rise in measles, and a 1.5-percent rise in pertussis cases.

By the fall of 1979, following a major Federal childhood immunization initiative, 91 percent of more than 24 million school children assessed in kindergarten through eighth grade had become protected against measles, polio, and diphtheria, pertussis, and tetanus (DPT). Eighty-four percent were protected against rubella. The protection levels among 3.2 million school enterers were as follows: measles, 92 percent; rubella, 89 percent; mumps, 81 percent; polio, 95 percent; and DPT, 96 percent. This encouraging movement toward complete protection against vaccine preventable diseases reflects the combined interest and activities of parents, public health officials, and physicians.

Sexually Transmitted Diseases

The prevention, early diagnosis, and prompt treatment of sexually transmitted diseases have been limited severely by the silence, apathy, ignorance, and connotations of shame that surround them. In consequence, these diseases, most of which lend themselves to effective control, are on the increase. They represent one of the signal failures of prevention in the United States today.

Violent Deaths

Next to motor vehicle accidents, injuries from firearms cause the greatest number of violent deaths in the U.S. population. In 1978, there were 31,000 deaths from gunshot wounds, or about 14 per 100,000 population. By contrast, in England and Wales in 1976, there were less than 300 deaths from gunshot wounds, or about 0.6 per 100,000 population.

Striking failures of prevention to date are in reducing the rates of homicides and suicides in the population. Murder is more common among the poor and minority groups. Among the age group 15-19 years of age, homicide rates for white males and white females increased (figure 22). For the male population of races other than white, the age-adjusted rate for homicide peaked in 1972 (83.1 per 100,000); and for those in this population 15-19 years of age, the homicide rate peaked in 1971 (60.2 per 100,000).

The figure also shows wide differences in rates according to color and sex. In 1977, young black men were five times as likely to become victims of homicide as were young white men, and young black women were more than four times as likely to become victims as were young white women.

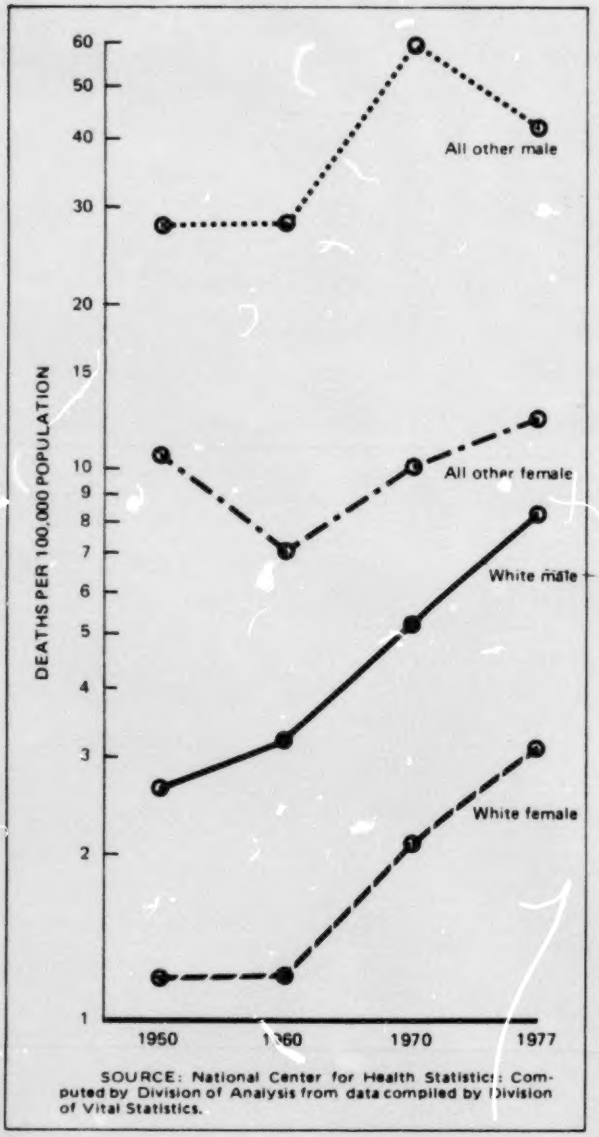
From 1960 through 1974, handgun sales quadrupled to more than 6 million a year; during the same period, the homicide rate increased from 4.7 per 100,000 to 10.2 for the overall population and from 5.9 to 14.2 for people 15-24 years of age.

Young white males are at much higher risk of suicide than other males of the same age (figure 23). As with homicides, young women are at consistently lower risk of suicide. The increase in the rate of suicide is much greater among young men than among young women. Firearm use has been increasing at a much faster rate than other means of suicide.

Summary

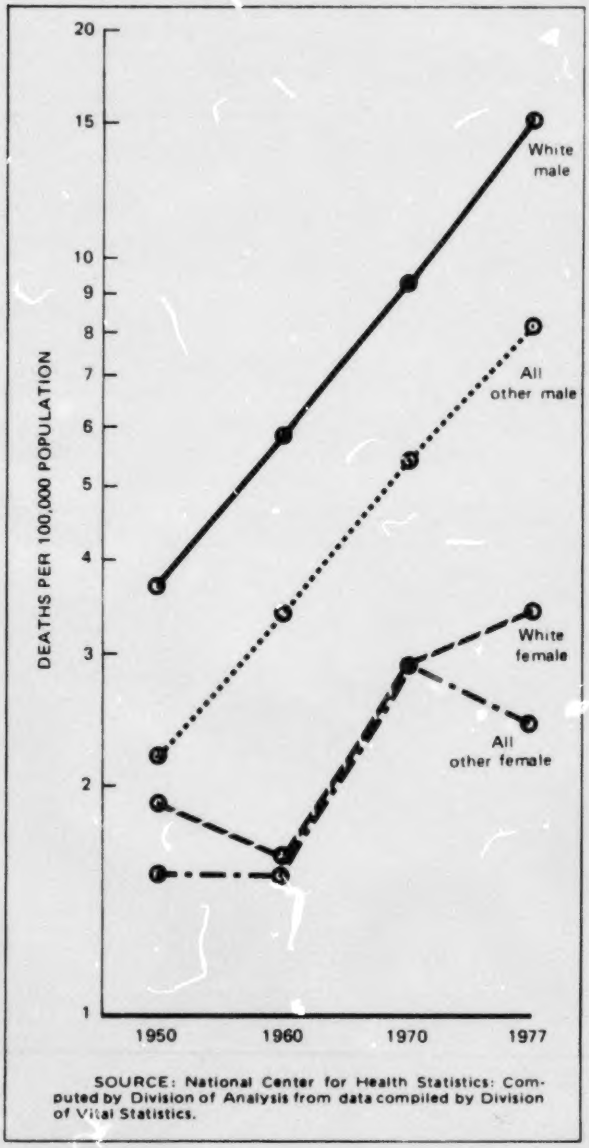
Looked at as a whole, the United States has scored some notable achievements in health promotion and disease prevention during the recent past, but the benefits of prevention have reached different groups of the population unevenly. Also, certain health problems have been addressed much more effectively than others. Age-adjusted death rates for heart disease, stroke, accidents, and influenza and pneumonia have declined sharply. However, death rates for cancers of the respiratory system and for homicide and suicide have risen sharply.

The extent of interest shown by large segments of the population in improving their chances for health is encouraging, as is their record of achievement in accomplishing positive change in many aspects of lifestyle, including smoking and nutrition. The growing willingness of the majority of the population to



SOURCE: National Center for Health Statistics: Computed by Division of Analysis from data compiled by Division of Vital Statistics.

Figure 22. Homicide rates for persons 15-19 years of age, according to color and sex: United States, selected years 1950-77



SOURCE: National Center for Health Statistics: Computed by Division of Analysis from data compiled by Division of Vital Statistics.

Figure 23. Suicide rates for persons 15-19 years of age, according to color and sex: United States, selected years 1950-77

seek out early diagnosis of conditions such as high blood pressure and breast and cervical cancer is also encouraging. However, the notable failures to prevent deaths from motor vehicle accidents among the Nation's children and youth, to reduce the toll from cancers of the respiratory system and from homicide and suicide, and to do much better in controlling high blood pressure among adults in middle and later years give little grounds for complacency.

Successes and failures in preventing breakdowns in mental health and in preventing increases in toxic agent hazards from the environment have not been discussed here because they are not yet measurable. They may be equally if not more important than the matters that this section has described. By the time the next *Prevention Profile* is presented to Congress in 1983, data should be available in these areas.

In all cases, much more progress can be expected if the pace of reduction of already identified risk factors quickens. While identification of research needs in prevention is beyond the scope of this report, the pace could be accelerated were more known about the extent and power of these and other risk factors and about how to facilitate the processes of positive behavioral, biological, and environmental changes so that individuals on their own behalf and society in general could take more effective actions.

SECTION IV: Tracking Future Progress in Reducing Risks

Overview

The Surgeon General's 1979 report, *Healthy People*, set broad goals for measurably reducing the burden of avoidable illness and early death during the current decade. These goals are to be achieved for each major age group of the population, as follows:

- 35-percent reduction in infant mortality.
- 20-percent reduction in deaths of children 1-14 years of age.
- 20-percent reduction of deaths among adolescents and young adults 15-24 years of age.
- 25-percent reduction in deaths among those 25-64 years of age
- Major improvement in health, mobility, and independence of older people, expressed as a 20-percent reduction in the average annual number of days of restricted activity due to acute or chronic conditions.

These broad goals are further delineated in another report, *Promoting Health/Preventing Disease—Objectives for the Nation* (OASH-SG, 1980). This document sets forth a series of national targets for accomplishment in the following 15 areas: control of high blood pressure; family planning; pregnancy and infant health; immunization; sexually transmitted diseases; toxic agents; occupational health; fluoridation and dental health; surveillance of infectious disease; smoking; misuse of alcohol and drugs; nutrition; physical fitness and exercise; and stress. They reflect the efforts and judgments of many individuals and organizations both in the private sector and within government who brought special expertise and experience to the initial drafting and the subsequent revision.[1] Some objectives are directed at reducing death rates and related measures of poor health; others are aimed at reducing measurable risks, increasing public and professional awareness of risk and risk-reduction possibilities, and improving services. The measurement of risks and the measurement of progress in reducing them demand reliable data for establishing baselines and reporting trends. Thus another group of objectives relates to developing surveillance systems.

In requiring a triennial *Prevention Profile*, Congress has in effect called for a systematic tracking of the Nation's progress toward preventing unnecessary disability or premature death. Since almost every one of the specific objectives set forth in the document is preceded by a statement about where the Nation now stands in respect to the matter at hand, the objectives collectively constitute a natural framework for such tracking. This section, therefore, draws heavily on this resource.

In the pages to follow, the major national objectives to be attained by 1990 are summarized for each of the 15 subject areas.[2] Where reliable baseline data exist and data reporting is assured, specific objectives are stated in full. In some instances, data are presented in tables or graphs to show where the Nation stood at last reporting and where it can stand by 1990 if the objectives are attained.

Future prevention reports can supply the relevant numbers for successive periods. These miniscorecards of specific objectives comprise the initial building blocks of an emerging system to track the Nation's advancement toward its prevention goals and to review these goals in light of new research findings. To the extent that necessary data become available during the years to come, a far greater number of the Surgeon General's prevention objectives can be measured, and progress toward them tracked.

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[1] Drafts of the objectives were developed by 15 work groups at a conference in Atlanta, Ga., in June 1979 (U.S. Department of Health, Education, and Welfare, 1979). More than 4,000 copies of the drafts were then circulated for public review. On the basis of comments received, in early 1980 the draft objectives were revised, and additions made. The final statements were issued by the Surgeon General in November of that year (Office of the Assistant Secretary for Health and the Surgeon General, 1980).

[2] In a few instances, earlier attainment is feasible, and national objectives are established for 1985.

High Blood Pressure

A variety of approaches must be taken if what is now known or suspected about high blood pressure control is to be translated into concrete help for the 60 million people who are currently placed at higher than average risk for heart disease and stroke by this condition. These approaches include effectively communicating to the public the health risks associated with high blood pressure and continuing to encourage regular blood pressure checks. Other aspects include informing individuals as to whether their own current blood pressure is normal (i.e., at or below 140 mmHg, systolic, or 90 mmHg, diastolic) or elevated and, if elevated, actively encouraging them to take appropriate measures for control and long-term maintenance of such control. Other necessary steps are to encourage lower rates of significant overweight in the population, to encourage lower average rates of salt consumption, and to enable people to make better informed food purchases assisted by labeling that clearly specifies both salt and calorie content.

Through a combination of these approaches, a major national objective can be reached:

- By 1990, at least 60 percent of the estimated population having definite high blood pressure (160/95) should have attained successful long term blood pressure control, i.e., a blood pressure at or below 140/90 for 2 or more years.

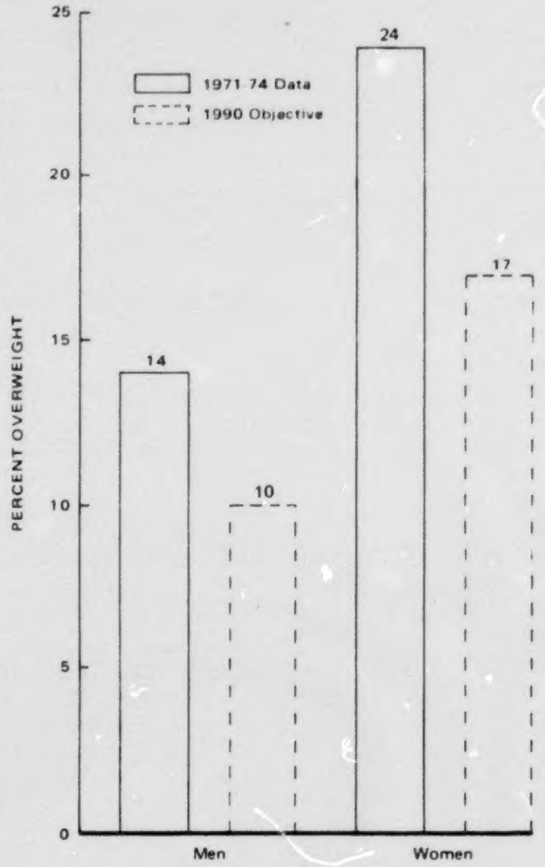
While this is the principal objective for high blood pressure control, progress toward it cannot as yet be systematically tracked. However, recent data from several statewide and local cross-sectional studies indicate that only between 25 and 60 percent of definite hypertensives have controlled their blood pressure to levels below 160/95. As yet, no data are available with which to establish a reliable national baseline from which to chart progress toward long-term control throughout the decade.

Progress in reducing the prevalence of significant overweight is one objective where presently available data do permit tracking:

- By 1990, the prevalence of significant overweight (120 percent of desired weight) among the U.S. adult population should be decreased to 10 percent of men and 17 percent of women, without nutritional impairment.

Prevalence of significant overweight in a national sample of the population was last measured in the 1971-74 National Health and Nutrition Examination Survey conducted by the National Center for Health Statistics. According to this survey, 14 percent of men and 24 percent of women exceeded 120 percent of desired weight for their height and sex (figure 24).

Another objective is the reduction in average daily salt consumption. (See the section on nutrition.)



SOURCE: Division of Health Examination Statistics, National Center for Health Statistics: Health and Nutrition Examination Survey.

Figure 24. Reduce prevalence of overweight: Adults 18-74 years of age more than 120 percent of desired weight

Family Planning

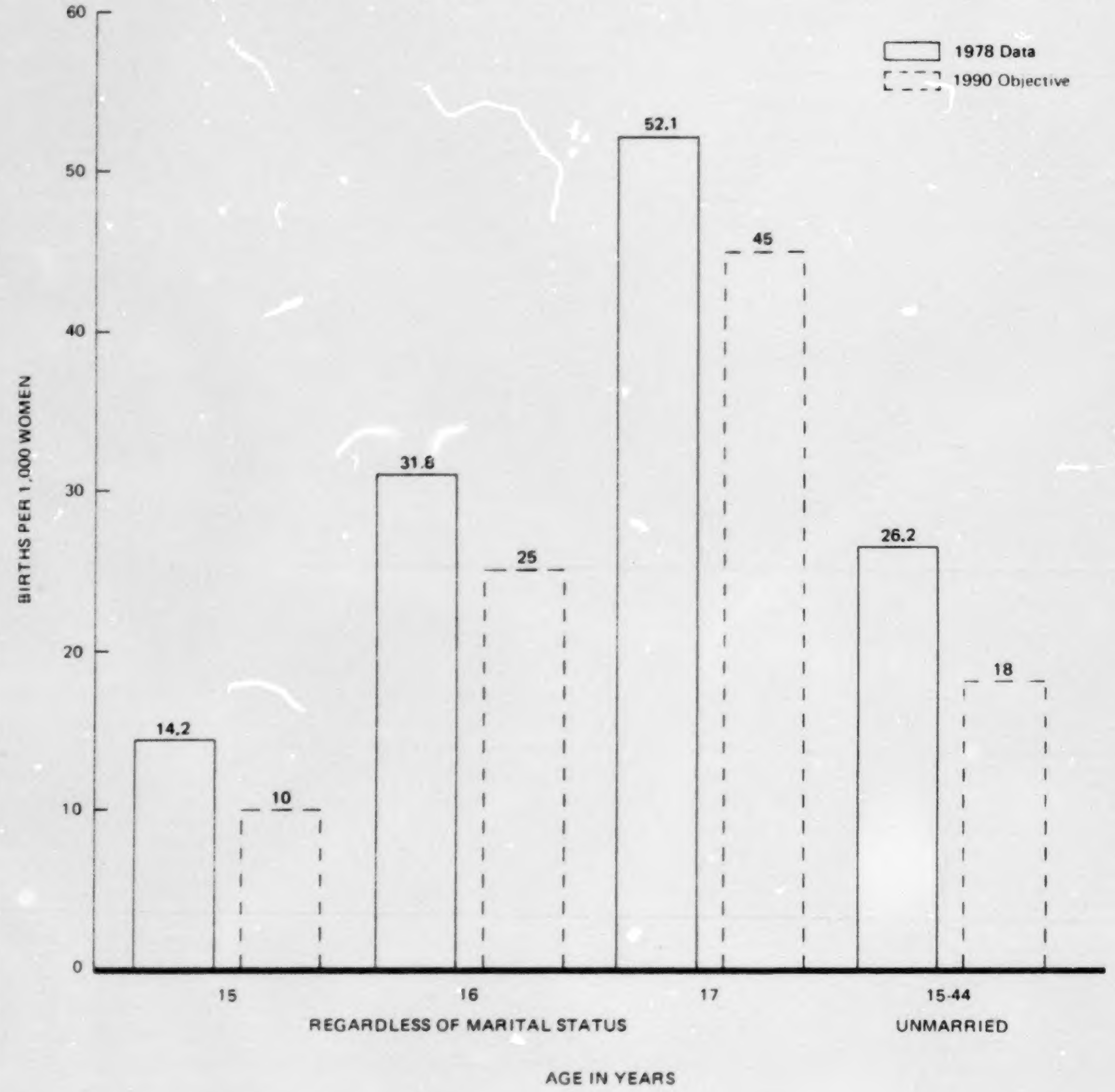
Family planning includes measures to prevent unplanned births (both unwanted and mistimed) and to overcome unintended infertility. The general principles of family planning are (1) to provide individuals with adequate information that they can use as a basis for making decisions about conceiving, bearing, and becoming parents of healthy children, and (2) to make available to individuals effective and maximally safe means by which they can implement their decisions.

Previous sections have noted the signal successes of family planning in reducing unplanned births among ever married women. Most of the specific improvements in family planning needed for the 1980's relate to the reduction of the still relatively high rates of unplanned births among medically and socially high-risk women, especially teenagers, black women, and poor women. Pregnancies among teenagers, among women who are unmarried, among women over 34 years of age, and among high parity women are all associated with higher than average rates of maternal and/or infant morbidity and mortality. They are also more likely than other pregnancies to be unplanned. In 1976, the proportion of unplanned births (5 years prior to interview) was 50 percent higher in poor than in nonpoor families (46.5 percent of births reported by ever married women with family incomes below 150 percent of the poverty level were unwanted, compared with 29.2 percent for women with family incomes of 150 percent of poverty level or higher). Also, ever married black women in a 1976 survey reported that 48 percent of births to them during the 5 years prior to interview had been unplanned, whereas white women reported that only 32 percent of births to them had been unplanned.

Fortunately, data from continuing national surveys are available to provide reliable baselines and to report future trends. The first objective is as follows:

- By 1990, there should be virtually no unintended births to girls 14 years of age or under. Fulfilling this objective would probably reduce births in this age group to near zero.

In 1978, there were 10,714 such births. The current rates and objectives set for other teenage girls and for all single women are displayed in figure 25. A larger proportionate reduction in fertility rates is called for among the very young teenagers than



SOURCE: Division of Vital Statistics, National Center for Health Statistics.

Figure 25. Reduce fertility rates for teenagers and unmarried women

among the older ones, commensurate with the greater health and social risks associated with pregnancies at younger ages. Also, many births to young women in their later teens are planned and wanted. The objectives, as stated, allow for such intended births. A closely related goal is to reduce by half the current disparity between American women of different economic levels in their ability to avoid unplanned births. (See figure 19.)

Oral contraceptive pills with a high estrogen content substantially increase risks of subarachnoid (brain) hemorrhage and heart attacks, especially when used by habitual smokers. They may have other adverse side effects. An objective for reducing this risk follows:

- By 1985, oral contraceptives containing more than 50 micrograms of estrogen should not be used for family planning methods, and sales of these preparations should have been reduced to 15 percent. (In 1978, about 27.1 percent of preparations sold were at this level.)

Other specified safety measures include reducing the proportion of abortions performed in the second trimester of pregnancy from the 10.6 percent level of 1976 to 6 percent.

Pregnancy and Infant Health

Major objectives for the 1980's include lowering the rates of infant and maternal deaths and closing current gaps in such rates between racial and ethnic groups and between people who live in metropolitan and medically underserved areas. Closely related are objectives to extend and improve the health of pregnant women and infants and to improve access to prenatal and interpartum care.

Objectives for reducing infant and maternal deaths are as follows:

- By 1990, the national infant mortality rate (deaths for all babies up to 1 year of age) should be reduced to no more than 9 deaths per 1,000 live births. (In 1978, the infant mortality rate was 13.8 per 1,000 live births.)
- By 1990, no county and no racial or ethnic group of the population (e.g., black, Hispanic, Indian) should have an infant mortality rate in excess of 12 deaths per 1,000 live births. (In 1978, the infant mortality rate for whites was 12.0 per 1,000 live births; for blacks 23.1 per 1,000 live births; for American Indians 13.7 per 1,000 live births; rate for Hispanics is not yet available separately.)
- By 1990, the neonatal death rate (deaths for all infants up to 28 days old) should be reduced to no more than 6.5 deaths per 1,000 live births. (In 1978, the neonatal death rate was 9.5 per 1,000 live births.)
- By 1990, the perinatal death rate should be reduced to no more than 5.5 per 1,000. (In 1977, the perinatal death rate was 15.4 per 1,000. NOTE: The perinatal death rate is total deaths, late fetal deaths over 28 weeks gestation plus infant deaths up to 7 days old, expressed as a rate per 1,000 live births and late fetal deaths.)
- By 1990, the maternal mortality rate should not exceed 5 per 100,000 live births for any county or for any ethnic group (e.g., black, Hispanic, American Indian). (In 1978, the overall rate was 9.6; the rate for blacks was 25.0, the rate for whites 6.4, and for American Indians 12.1; the rate for Hispanics is not yet available separately.)

Measurable objectives to increase early participation in prenatal care and to reduce the prevalence of low birth weight are as follows:

- By 1990, the proportion of women in any county or racial or ethnic group (e.g., black, Hispanic, American Indian) who obtain no prenatal care during the first trimester of pregnancy should not exceed 10 percent. (In 1978, 40 percent of black mothers and 45 percent of American Indian mothers received no prenatal care during the first trimester; percent of Hispanics is unknown.)
- By 1990, low birth weight babies (2,500 grams and under) should constitute no more than 5 percent of all live births. (In 1978, the proportion was 7.0 percent of all births.)
- By 1990, no county and no racial or ethnic group of the population (e.g., black, Hispanic, American Indian) should have a rate of low birth weight infants (prematurely born and small-for-age infants weighing less than 2,500 grams) that exceeds 9 percent of all live births. (In 1978, the rate for whites was about 5.9 percent, for Indians about 6.7 percent, and for blacks about 12.9 percent; rates for Hispanics are not yet separately available; rates for some other Nations are 5 percent and less.)

Figure 26 shows the infant and maternal mortality rates in 1978 as well as rates of early prenatal care participation and low birth weight outcomes. Each is juxtaposed to the corresponding 1990 target objective. As can be seen, the most apparent challenges lie in reducing infant and maternal mortality among blacks and in increasing the average birth weight of black babies. The challenges to improve the outcomes of pregnancies of Hispanic women may prove to be just as great when baseline data become available to show their 1981 status.

	1978 Data	1990 Objective
	Deaths per 1,000 live births	
Infant mortality		
National	13.8	9
Black	23.1	12
Neonatal mortality[1]	9.5	6.5
Perinatal mortality[2](1977)	15.4	5.5
	Deaths per 100,000 live births	
Maternal mortality		
National	9.6	([3])
Black	25.0	5
	Percent of live births	
Prenatal care began in first trimester of pregnancy		
National	74.9	([3])
Black	60.2	90
Birth weight 2,500 grams or less		
National	7.0	5
Black	12.9	9

[1] Includes deaths within 28 days of birth.

[2] Includes late fetal deaths over 28 weeks gestation plus infant deaths within 7 days of birth. The rate is the number of perinatal deaths per 1,000 live births and late fetal deaths.

[3] No set objective.

SOURCE: Division of Vital Statistics, National Center for Health Statistics.

Figure 26. Pregnancy and infant health objectives

Other pregnancy and infant health objectives relate to the prevention of birth defects and severe mental retardation (IQ less than 50) resulting from known biomedical causes.

- By 1990, the incidence of neural tube defects should be reduced to 1.0 per 1,000 live births. (In 1979, the rate was 1.7 per 1,000.)
- By 1990, Rhesus hemolytic disease of the newborn should be reduced to below a rate of 1.5 per 1,000 live births. (In 1977, the rate was 1.8 per 1,000.)

To accomplish reduction in birth defects by 1990, all pregnant women at high risk of poor pregnancy outcome should have access to information on amniocentesis and prenatal chromosomal diagnosis and therapy as indicated. All newborns should be provided neonatal screening for metabolic disorders for which effective and efficient tests are available. Examples of such disorders include PKU and congenital hypothyroidism.

A final set of objectives relates to the delivery of maternal and perinatal health services. These include instituting regional systems of primary, secondary, and tertiary care that would be accessible to all women and infants for prenatal, maternal, and perinatal health services; effectively communicating to pregnant women about risk factors such as smoking and drug and alcohol use and those related to nutrition; insuring appropriately attended, safe delivery provided in ways acceptable to them and their families; and providing that virtually all infants should be able to participate in primary health care that includes well child care; assessing growth and development; providing immunization; screening, diagnosis, treatment for conditions requiring special services; and appropriate counseling regarding nutrition, automobile safety, and prevention of other accidents.

Immunization

Vaccines are among the safest and most effective measures for preventing disease. Although high levels of childhood protection were obtained as of 1979 through immunization campaigns, continued efforts are required to complete the task. Vigilance is required to maintain past successes because the causal agents are still very much alive, with the exception those for smallpox, which has been eradicated.

Objectives for the 1980's are to reduce disease occurrence, to improve child and adult immunization levels, to improve the diffusion and application of new technology, and to improve data for immunization surveillance.

Specific objectives for reducing the number of reported cases of diphtheria, measles, mumps, pertussis, polio, rubella, congenital rubella syndrome, and tetanus, all of which are preventable through immunization, are shown in figure 27 along with the 1979 levels. A word of caution is necessary. Physicians are known to underreport the cases of childhood diseases they treat; responses to questions on household surveys indicate that many more cases probably occurred in 1979 than figure 27 includes. As the completeness of reporting improves in the future, there may be temporary increases in the number of reported cases. Thus real progress toward reaching the 1990 objectives may be obscured.

Disease	1979 Data	1990 Objective
	Number of cases reported	
Diphtheria	59	50
Measles	13,597	500
Mumps	14,225	1,000
Pertussis	1,617	1,000
Polio	26	10
Rubella	11,795	1,000
Congenital rubella syndrome	62	10
Tetanus	81	50

SOURCE: (Center for Disease Control, 1980)

Figure 27. Reduce reported incidence of selected diseases

Other objectives to be attained by 1990 include the following: 90 percent of all children should have completed the recommended basic immunization series by 2 years of age; at least 95 percent of children in licensed day care facilities and all grades of school should be fully immunized. Among high-risk adults, as defined by the Immunization Practices Advisory Committee of the Department of Health and Human Services, 60 percent should be receiving annual immunization against influenza and pneumococcal pneumonia.

A final set of objectives relates to improving the reporting of data necessary for improved control. By 1990, at least 95 percent of those under 18 years of age should have up-to-date official immunization records. Also, at least 90 percent of those hospitalized and 50 percent of those not hospitalized with vaccine preventable diseases of childhood should be reported.

Sexually Transmitted Diseases

Objectives for the prevention of sexually transmitted diseases include measurably reducing the incidence by 1990, extending education and services, and better sharing of statistical data to improve control programs.

Figure 28 juxtaposes the rates for gonorrhea and syphilis reported in 1979 with the objective for 1990. In addition to a reduced number of reported cases, the incidence of serious neonatal and maternal infections due to sexually transmitted agents (especially herpes and chlamydia) should be reduced by half, and the incidence of nongonococcal urethritis and chlamydia infections in men should be reduced to two-thirds of its present level.

Disease	1979 Data	1990 Objective
	Cases reported per 100,000 population	
Gonorrhea	457	280
Syphilis, primary and secondary	11	7
Congenital syphilis [1]	3.7	1.5

[1] Under 1 year of age.

SOURCE: Center for Disease Control: *STD Fact Sheet*, Edition 35.

Figure 28. Reduce reported incidence of sexually transmitted diseases

Toxic Agent Control

Health problems attributed to toxic agents include acute effects, such as poisoning, teratogenic and developmental abnormalities, mutagenesis, cancer, neurologic and behavioral impairment, immunologic damage, and chronic degenerative diseases involving the lungs, joints, vascular system, kidneys, liver, and endocrine system.

Diseases associated with toxic agents affect people differently, depending on their sex, age, history of past exposures, and possible genetic predisposition. Similarly, the genetic effects of toxic agents may be manifested differently in future generations. For these reasons and because of the varying latency associated with many chronic diseases, the current incidence rates of diseases associated with toxic agents do not accurately measure either their true potency or the effectiveness of existing control and prevention efforts. This makes the tasks of risk identification and risk reduction enormously difficult, particularly because more than 60,000 chemical compounds are produced commercially and approximately 1,000 new compounds are introduced each year. Over 13,000 substances currently in commercial use have been identified as toxic agents.

Current evidence builds a convincing case for the carcinogenicity in humans of 20 chemicals and compounds, and more than 2,300 specific chemicals are suspected carcinogens. Also, more than 20 agents are known to be associated with birth defects in humans; many times this number are associated with birth defects in animals.

The principal sources of environmental health hazards presently subject to Federal regulation include the following: air and/or water emissions and/or effluents; automobile exhaust emissions; X-ray equipment; hazardous waste disposal; transportation of hazardous materials; and occupational exposures. Standards have been established for air quality, for safe drinking water, and for certain types of occupational exposure. Such standards are now being developed for hazardous waste disposal and for transportation of toxic materials.

Environmental objectives for 1990 include the following: eliminating miscarriages and birth defects associated with toxic agent exposures; reducing health risks of contaminated ground water, surface water, or soil from industrial toxins associated with waste water; and assuring that the air is good to breathe and the water safe to drink.

No one knows the extent to which water and soil are currently contaminated. However, in 1980, the Environmental Protection Agency is starting a series of programs to prevent new contamination; and by 1990, there should be almost no contamination of water that is preventable associated with waste-water management. A related objective is to develop a plan to protect humans from the consequences of toxic agents in existing sites of toxic solid waste disposal.

Ionizing radiation can produce skin burns, gastrointestinal disturbances, bone marrow depression, and cancer. Most manmade sources of ionizing radiation derive from diagnostic and therapeutic medical applications; the remainder, so far a small percent, derive from one or another use of or fallout from nuclear power. While serious inadequacies exist in reporting data on the presence of toxic agents and exposure to low level ionizing radiation, some crude baseline data are available to use in tracking future progress toward the risk reduction objectives as follows:

- By 1990, virtually all communities should experience no more than one day per year when air quality exceeds an individual ambient air quality standard with respect to sulphur dioxide, nitrous dioxide, carbon monoxide, lead, hydrocarbon, and particulate matter. (In 1979, the level was estimated to be 50 percent.)
- By 1990, at least 95 percent of the population should be served by community water systems that meet Federal and State standards for safe drinking water. (In 1979, the level was 85 to 90 percent for the National Interim Primary Drinking Water Standards.)

By 1990, the total number of medically unnecessary diagnostic X-ray examinations should be reduced by some 50 million. By 1990, hazards from inhalation of fumes from toxic materials during transportation should be eliminated.

There should be no pesticides, herbicides, fungicides, or rodenticides available for sale by 1990, which are known to be carcinogenic, teratogenic, or mutagenic in man, unless determined to be vital to the national interest under certain conditions. Individuals purchasing a potentially toxic product of any kind should be protected by clear labeling of contents and directions for the product's use and disposal. Also by 1990, 80 percent of U.S. communities should have a rate of lead toxicity among children under 6 years of age of less than 500 cases per 100,000 children, and 90 percent of that age group identified with lead toxicity should have been brought into medical and environmental management. Finally and most broadly, by 1990 the Toxic Substances Control Act and the Resource Conservation and Recovery Act should be fully implemented to protect the U.S. population against hazards resulting from production, use, and disposal of toxic chemicals.

No comprehensive surveillance system exists by which to monitor new or continuing environmental threats to health. Thus the following set of objectives is especially important:

- By 1990, a broad scale surveillance and monitoring system should have been planned to discern and measure known environmental hazards of a continuing nature as well as those resulting from isolated incidents. Such activities should be continuously carried out at both Federal and State levels.
- By 1990, a central clearinghouse for observations of agent/disease relationships and host susceptibility factors should be fully operational, as well as a national environmental data registry to collect and catalogue information on concentrations of hazardous agents in air, food, and water.

When safe exposure limits are exceeded, or threatened to be exceeded, prompt action is essential. Objectives related to this include the following:

- By 1990, every individual residing in an area with a population density greater than 20 per square mile or in an area of high risk should be protected by an early warning system designed to detect the most serious hazards.
- By 1990, every populated area of the country should be able to be reached within 6 hours by a toxic agent or chemical emergency team in the event of exposure to a serious environmental hazard.

Occupational Safety and Health

The National Institute for Occupational Safety and Health estimates that 100,000 Americans die each year from occupational illnesses. Nearly 400,000 new cases of occupational diseases occur annually. (These estimates are controversial, but no better ones are available.) When multiple etiological factors are considered, 10-20 percent of all cancer cases may be related to carcinogens in the workplace.

In 1978, work-related accidents resulted in 13,000 deaths and 2.2 million disabling injuries, 80,000 of which were permanently disabling. For every 100 full-time workers, there was an average of 9.2 work-related disabling injury cases, which accounted for approximately 61 workdays lost and restricted-activity days per 100 full-time workers.

Objectives established for 1990 concern reductions in work-related deaths and injuries, better identification of worksite hazards and illnesses, increased knowledge by workers of their personal worksite hazards and risks, reduction in worksite hazards, and strengthened epidemiologic and surveillance capabilities. Figure 29 presents the latest available data on deaths from work-related accidents, work-related disabling injuries, and workdays lost due to injury in relation to the 1990 objectives, which are as follows:

- By 1990, workplace accident deaths for firms or employers with 11 or more employees should be reduced to less than 3,750 per year. (In 1978, there were 4,170 work-related fatalities for firms or employers with 11 or more employees.)

Item	1978 Data	1990 Objective
	Number per year	
Deaths[1]	4,170	3,750
	Rate per 100 full-time workers	
Disabling injuries	9.2	8.3
Workdays lost	62.1	55

[1] In companies employing 11 or more persons.

SOURCE: (Bureau of Labor Statistics, 1980)

Figure 29. Reduce deaths, disabling injuries, and workdays lost due to work-related accidents

- By 1990, work-related disabling injuries should be reduced to 8.3 cases per 100 full-time workers. (In 1978, there were approximately 9.2 cases per 100 workers.)
- By 1990, lost workdays due to injuries should be reduced to 55 per 100 workers annually. (In 1978, approximately 62.1 days per 100 workers were lost.)

Reductions to be achieved by 1990 appear modest, but they must be made in areas where the trends have been rising.

Another measurable objective concerns control of specific, preventable diseases for which workers in particular occupations are routinely examined.

- By 1990, among workers newly exposed after 1985, there should be virtually no new cases of four preventable occupational diseases—asbestosis, byssinosis, silicosis, and coal worker's pneumoconiosis. (In 1979, there were an estimated 5,000 cases of asbestosis; in 1977, an estimated 84,000 cases of byssinosis were expected in active workers; in 1979, an estimated 60,000 cases of silicosis were expected among active workers in mining, foundries, stone, clay and glass products, and abrasive blasting; in 1974, there were an estimated 19,400 cases of coal worker's pneumonoconiosis.)

The annual incidence of coal worker's pneumoconiosis is unknown. However, in the late 1970's, more than 4,000 deaths per year were attributed to black lung disease. Currently, about 15 percent of the coal mining work force shows evidence of this disease.

Identifying occupational hazards and illnesses requires that generic standards be developed to prevent major common health hazards due to injury and toxic exposures and that increased numbers of evaluations for health hazards be made. In addition, physicians and other health care providers should routinely question their patients about occupational hazards to health and record the responses as part of their patients' medical histories.

Another objective relates to increasing worker's knowledge of personal work-site risks.

- By 1990, at least 25 percent of workers should be able to state the nature of their occupational health and safety risks and their potential consequences prior to employment, as well as be informed of changes in these risks while employed. (In 1979, an estimated 5 percent of workers were fully informed.)

Other objectives related to knowledge of risks at work include routinely informing workers about their personal exposure measurements, about the results of their health examinations, and about lifestyle behaviors that interact with factors in the work environment to increase personal risks. Objectives to reduce worksite hazards include a phased program for the development and approval of hazard control plans for new processes, equipment, and installations in industry. Finally, better data and better surveillance systems are required if occupational safety and health are to be measurably improved.

- By 1985, an ongoing occupational health hazard/illness/injury coding system, survey, and surveillance capability should be developed, including identification of workplace hazards and related health effects, including cancer, coronary heart disease, and reproductive effects.

Accident Prevention and Injury Control

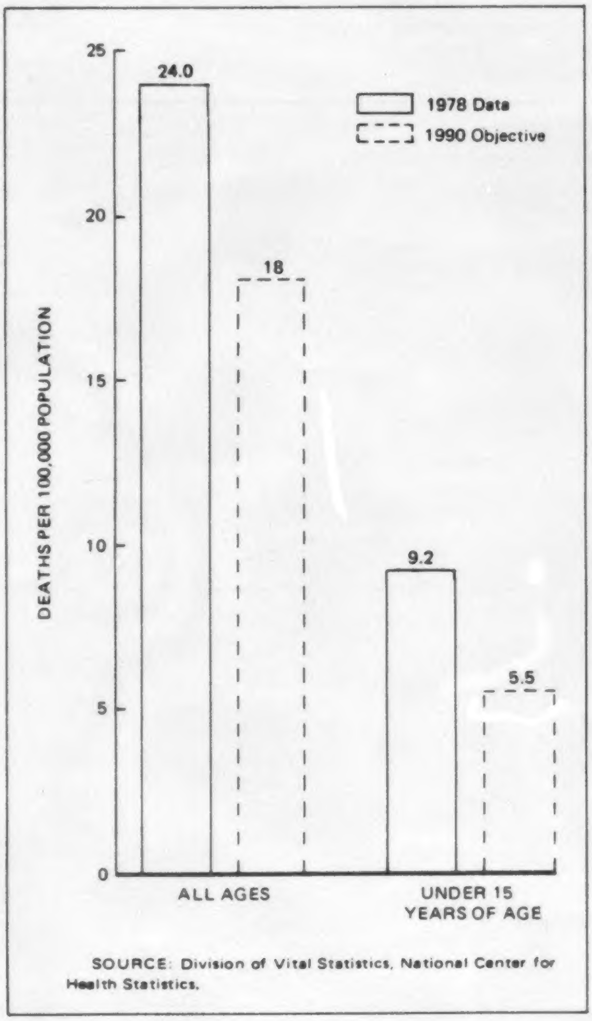
Objectives related to accident prevention and injury control to be attained by 1990 include reducing the rate of deaths due to motor vehicle accidents in general and the rate for children in particular. They also include reducing deaths and injuries from other accidents.

Because there are several sources of continuing data that report both accident fatalities and accident injuries, a number of measurable objectives can be included in an ongoing tracking system. The objectives relating to prevention of deaths from motor vehicle accidents are as follows:

- By 1990, the motor vehicle fatality rate should be reduced to no greater than 18 per 100,000 population. (In 1978, it was 24.0 per 100,000 population.)

- By 1990, the motor vehicle fatality rate for children under 15 years of age should be reduced to no greater than 5.5 per 100,000 children. (In 1978, it was 9.2 per 100,000 children under 15.)

Figure 30 presents the 1978 rates relative to both these objectives together with the projected 1990 rates. In this particular area, any one or any combination of several possible events during the 1980's could dramatically reduce motor vehicle fatalities even below the 1990 objectives here stated. These include the following: drastic reductions in weekend pleasure driving by teenagers resulting from shortages, high prices, or rationing of gasoline; adoption of State laws raising the drinking age; adoption of passive restraint systems in new models of cars; widespread adoption and use of child car safety devices.



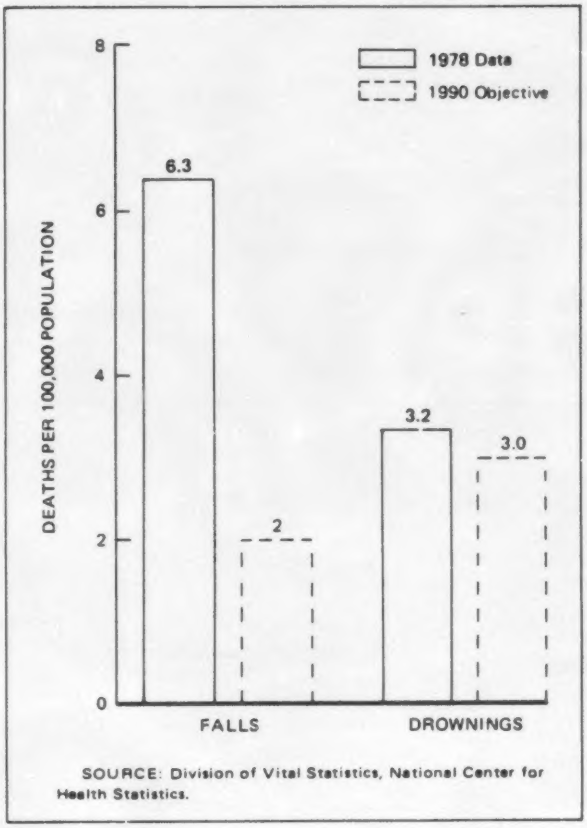
SOURCE: Division of Vital Statistics, National Center for Health Statistics.

Figure 30. Reduce mortality from motor vehicle accidents

Objectives to reduce deaths and injuries from other accidents that can be tracked are as follows:

- By 1990, the home accident fatality rate for children under 15 years of age should be no greater than 5.0 per 100,000 children. (In 1978, it was 6.1 per 100,000 children under 15.)
- By 1990, the mortality rate from falls should be reduced to no more than 2 per 100,000 persons. (In 1978, it was 6.3 per 100,000.)
- By 1990, the mortality rate from drowning should be reduced to no more than 3.0 per 100,000 persons. (In 1978, it was 3.2 per 100,000.)
- By 1990, the number of tapwater scald injuries requiring hospital care should be reduced to no more than 2,000 per year. (In 1978, it was 4,000 per year.)

Figure 31 displays the 1978 death rates from drownings and falls and shows the 1990 target rates. Other reductions of deaths and injuries are possible both from better prevention of firearm accidents and of residential fires.

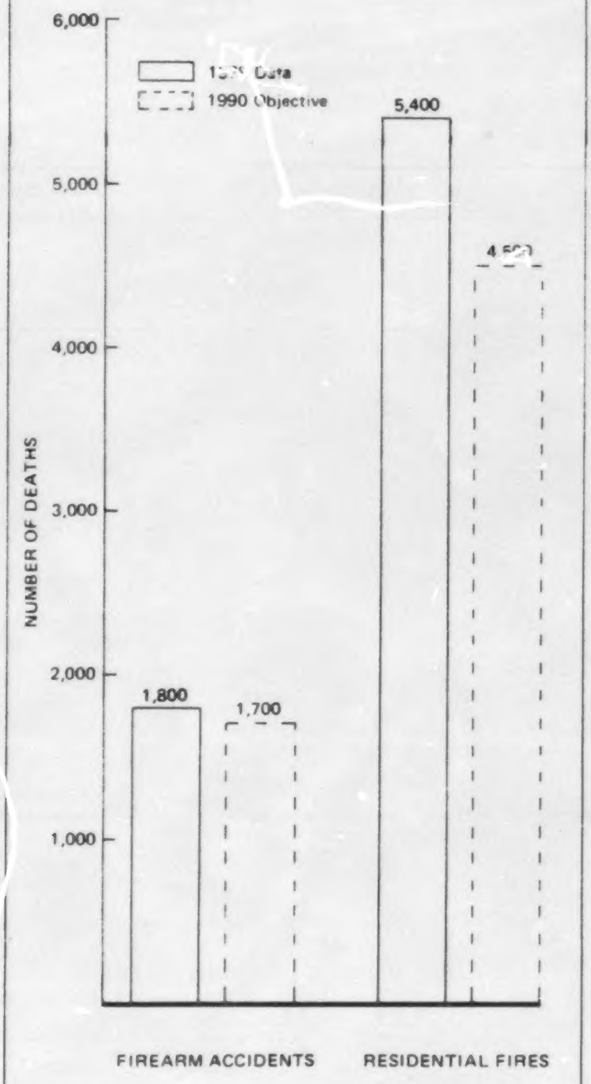


SOURCE: Division of Vital Statistics, National Center for Health Statistics.

Figure 31. Reduce mortality from falls and drownings

- By 1990, the number of accidental fatalities from firearms should be held to no more than 1,700 per year. (In 1978, there were 1,800.)
- By 1990, accidental deaths from residential fires should be reduced to no more than 4,500 per year. (In 1978, there were 5,400.)

Figure 32 portrays the 1978 baseline rates for accidental deaths from firearms and residential fires together with the 1990 objectives.



SOURCE: Division of Vital Statistics, National Center for Health Statistics.

Figure 32. Reduce accidental deaths from firearm accidents and from residential fires

Dental Health

Dental disease prevention covers the spectrum of many activities, from the fluoridation of community and school water supplies, through dental health education, to individual improvement of oral hygiene and dietary practices of children and adults.

Tooth decay affects 98 percent of the U.S. population, creating a dental disease problem of massive proportions. By 17 years of age, 94 percent of children have had tooth decay in permanent teeth, with an average of nine teeth affected. Among adults, periodontal disease creates serious problems.

Objectives for improving the dental health of the population include the following:

- By 1990, the proportion of children nine years of age who have experienced dental caries in their permanent teeth should be decreased to 60 percent. (In 1971-74, it was 71 percent.)
- By 1990, the prevalence of gingivitis in children 6 to 17 years of age should be decreased to 18 percent. (In 1971-74, the prevalence was about 23 percent.)
- By 1990, in adults the prevalence of gingivitis and destructive periodontal disease should be decreased to 20 percent and 21 percent, respectively. (In 1971-74, 25 percent of adults 18 to 74 years of age had gingivitis and 23 percent had destructive periodontal disease.)

The reductions in caries, gingivitis, and periodontal disease that should be attained by 1990 are not great. But since very large numbers of children and adults currently experience these conditions, even a modest reduction in rates would represent significant prevention.

Drinking water that is deficient in naturally occurring fluoride can be adjusted to the optimum level for dental health, thereby preventing dental caries by up to 65 percent. Yet only about 60 percent of the population living in communities served by water systems currently has fluoridated water.

Objectives for improving oral health relate first to fluoridation and then to improving oral hygiene and nutrition practices. Two objectives for fluoridation are as follows:

- By 1990, at least 99 percent of the population on community water systems should be receiving the benefits of optimally fluoridated water. (In 1975, it was 60 percent.)
- By 1990, at least 50 percent of school children living in fluoride-deficient areas that do not have community water systems should be served by an optimally fluoridated school water supply. (In 1977, it was about 6 percent.)

Surveillance and Control of Infectious Diseases

Current surveillance and classification systems tend to understate the impact of infectious diseases on the health and well being of the population. The category of influenza and pneumonia is among the leading causes of death. If the deaths in this group were to be included with deaths in a category containing all infectious diseases, the numbers would be considerably larger.

Protection from infectious diseases includes better understanding and practice of basic hygienic measures. Such measures include handwashing; proper handling of food; improved water treatment systems; regulatory measures relating to food processing, food service, and waste disposal; better technology to permit and safeguard sterilization or disinfection.

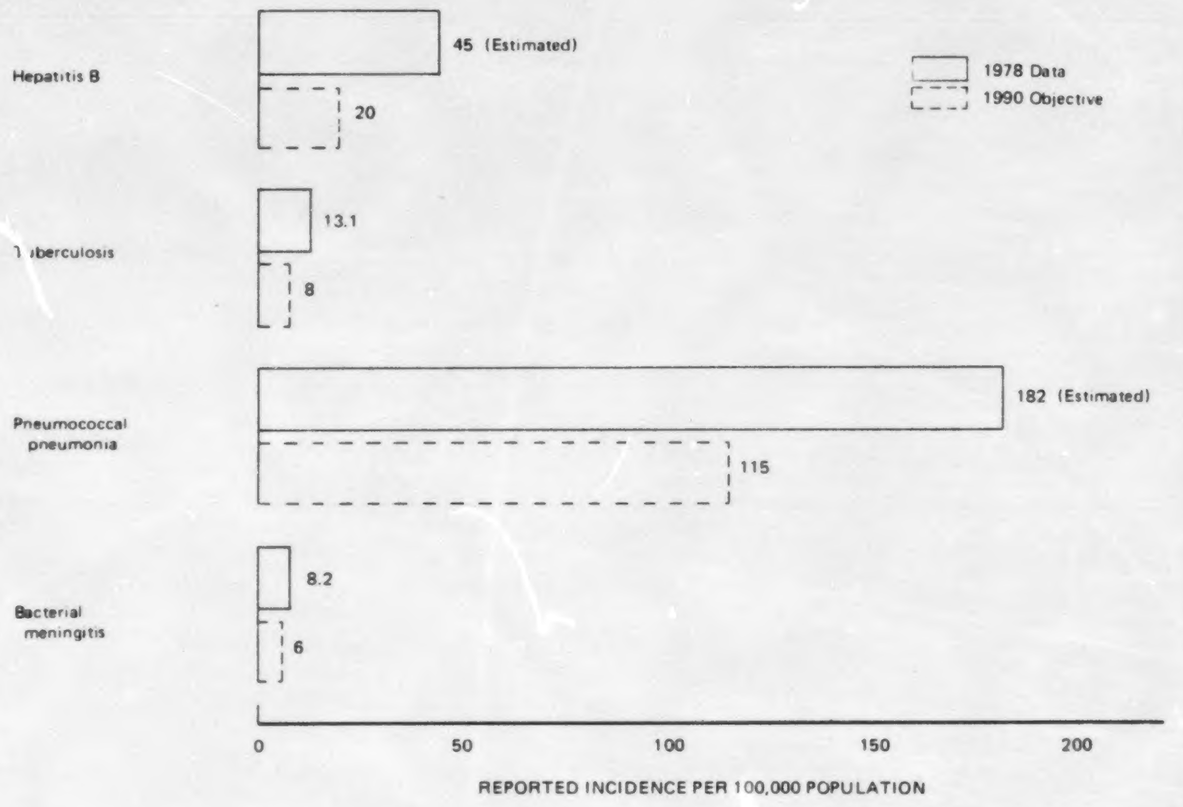
Objectives for surveillance and control of infectious diseases include reducing the incidence of infectious diseases, applying new protective measures in a timely manner, and improving surveillance systems.

Figure 33 displays rates for four leading infectious diseases that lend themselves to prevention and control: hepatitis B, tuberculosis, pneumococcal pneumonia, and bacterial meningitis. The most recent, available baseline figures are presented, and the corresponding 1990 objectives juxtaposed.

Another partially measurable objective is for the reduction of preventable nosocomial infections.

- By 1990, the (risk-factor-specific) incidence of nosocomial infections in acute-care hospitals will be reduced by 20 percent of what otherwise would pertain in the absence of hospital control programs. A similar percentage reduction should be seen in long-term care and residential care facilities.

Over 2 million nosocomial infections are acquired each year in community acute-care hospitals. In 1979, it was estimated that 5 percent of all hospital patients suffered nosocomial infections, and the



SOURCE: Center for Disease Control, Bureau of Epidemiology.

Figure 33. Reduce reported incidence of selected infectious diseases

overall rate of hospital acquired infections appears to be increasing, although less so in hospitals with good infection control programs. They are the primary or contributing cause of 60,000-80,000 deaths each year. Twenty percent of these infections are estimated to be preventable. Data systems are not now available to track progress in reducing infections in long-term care and residential care facilities.

Other sets of objectives concern more timely application of new protective measures and accumulation of better data for monitoring the prevalence and spread of infectious diseases.

- By 1990, data reporting systems in all States should be able to monitor trends of common infectious agents not now subject to traditional public health surveillance (respiratory illnesses, gastrointestinal illnesses, otitis media) and to measure the impact of these agents on health care cost and productivity at the local and State levels and, by extension, at the national level.

When such surveillance systems are in place, many new, measurable objectives for the prevention of infectious disease can be included in a tracking system.

Smoking and Health

As noted in earlier sections, cigarette smoking is an established risk factor for many diseases. It is a causal factor for coronary heart disease and peripheral artery disease, for cancers of the lung, larynx, oral cavity, esophagus, and pancreas, for chronic bronchitis and emphysema, and for allergic conditions. It is associated with cancer of the urinary bladder, peptic ulcers, retarded fetal growth, spontaneous abortion, increased infant mortality, and impaired growth and development during childhood. It acts synergistically with oral contraceptives to enhance the probability of thromboembolic disease, with alcohol to increase the risk of cancer of the larynx, oral cavity, and esophagus, with asbestos and other occupationally encountered substances to increase the likelihood of cancer of the lung, and with other risk factors to enhance cardiovascular risk. Involuntary inhalation of other people's cigarette smoke can precipitate asthmatic attacks. In addition, children of smokers have more respiratory disease in the first year of life. Finally, smoking contributes to death and injuries from fires, burns, and accidents.

Objectives to achieve during the next decade are to reduce cigarette smoking, to increase public and professional awareness of the risks smoking imposes on certain especially vulnerable subsets of the population, to adopt consumer protection measures, and to obtain data on which to base differential insurance premiums to nonsmokers.

Changes in rates of cigarette consumption by people of different ages and sexes can be tracked through existing data systems.

- By 1990, the proportion of adults who smoke should be reduced to below 25 percent.
- By 1990, the proportion of women who smoke during pregnancy should be no greater than one-half the proportion of all women who smoke. (Baseline data unavailable.)
- By 1990, the proportion of children and youths 12 to 18 years of age who smoke should be reduced to below 6 percent.

Figure 34 shows the reduction from 1979 levels that would be made if 1990 objectives were attained.

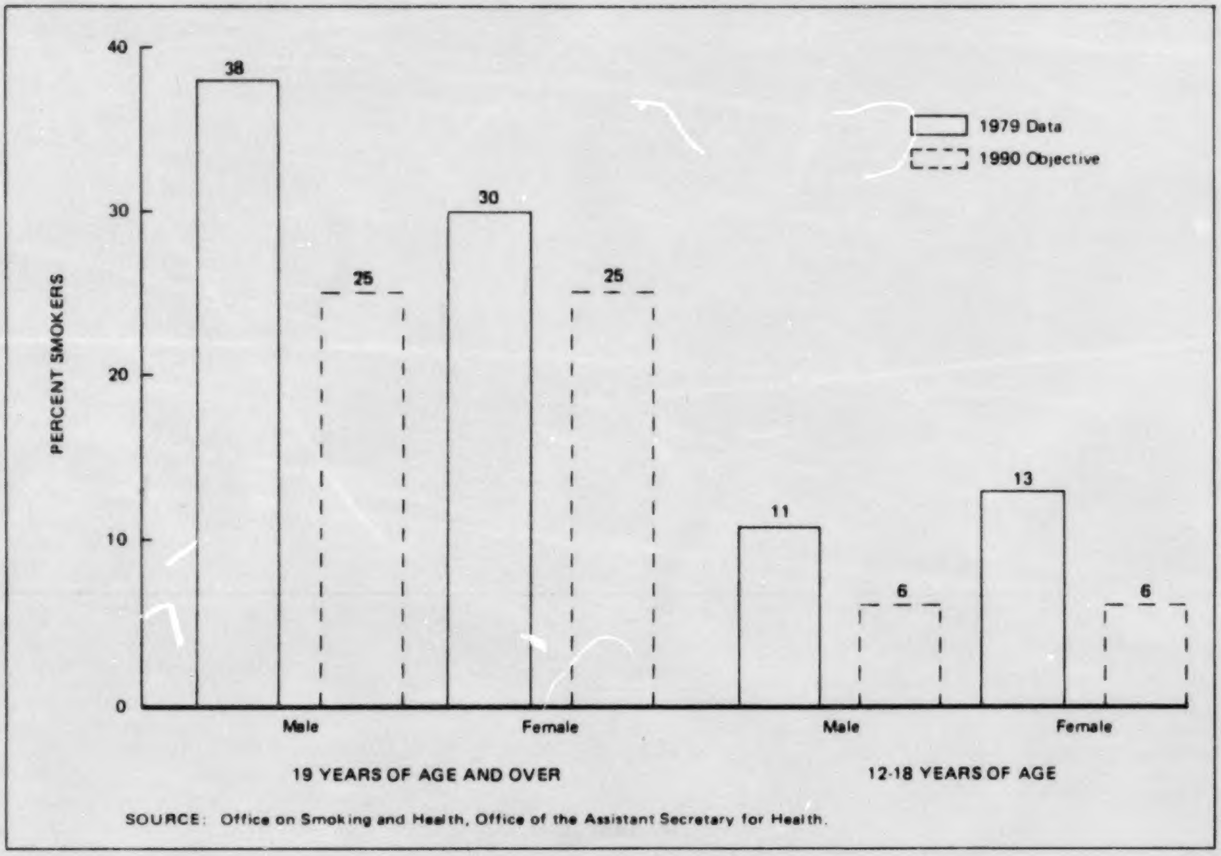
Objectives also focus on increasing the proportion of the population that understands the risk relationship of smoking to heart disease, to fetal and infant health, to chronic obstructive lung disease and lung cancer, and the added risks to women who take oral contraceptives. The 1981 National Survey of Family Growth, the 1980 National Natality Survey, and the 1980 National Fetal Mortality Survey will all provide baseline data on the rates of smoking among pregnant women and among women who take oral contraceptives. While there has been considerable analysis of disease prevalence by cigarette smoking status, there has been little analysis of these data to show changes in smoking habits after people have contracted a disease related to smoking.

Consumer protection objectives include enacting State laws banning smoking in enclosed public places, establishing separate smoking areas in work and dining areas, increasing the numbers of employer-employee sponsored smoking cessation programs, strengthening the present cigarette warning to increase its visibility, and prominently displaying tar, nicotine, and carbon monoxide content on cigarette packages and promotional materials. An objective that lends itself to tracking through time is:

- By 1990, the sales-weighted average "tar" yield of cigarettes should be reduced to below 10 mg. The other components of cigarette smoke known to cause disease should also be reduced proportionately. (In 1978, the sales-weighted average "tar" content was 16.1 mg.)

Misuse of Alcohol and Drugs

The many health and economic burdens imposed by alcohol and drug abuse have been described in previous sections. Major alcohol and drug policy objectives are to minimize the adverse social and health consequences associated with the use of such substances, especially among adolescents, young adults, and pregnant women. A related objective is to



SOURCE: Office on Smoking and Health, Office of the Assistant Secretary for Health.

Figure 34. Reduce cigarette consumption

minimize the number of adolescents who become users of alcohol and other drugs. The objective for preventing unsafe use of medical drugs is to increase consumer and professional sensitivity to the potential dangers inherent in the concurrent prescription and consumption of several drugs for and by the same individual and in the overprescribing and overconsumption of drugs generally, particularly for and by older people.

Data are available to track some of the objectives designed to minimize adverse consequences of alcohol and drug abuse. However, deaths attributable to misuse of alcohol are known to be underreported. On death certificates, physicians report a large proportion of alcohol-related deaths as caused by pneumonia, accidents, and suicides. Objectives to reduce deaths associated with alcohol and drug abuse are as follows:

- By 1990, the cirrhosis mortality rate should be reduced to 12 per 100,000 per year.
- By 1990, other drug related mortality should be reduced to 2 per 100,000 per year.
- By 1990, fatalities from motor vehicle accidents involving drivers with blood levels of 0.10 percent or more should be reduced to less than 9.5 per 100,000 population per year.
- By 1990, fatalities from other (nonmotor vehicle) accidents, indirectly attributable to alcohol use (e.g., falls, fires, drownings, ski-mobile, aircraft), should be reduced to 5 per 100,000 population per year.

Figure 35 presents these objectives in relation to the most recent death rates. As data become available, additional objectives can be developed based on similar measures for other drug related fatalities.

Objectives concerning alcohol and drug use do not seek an overall decline in per capita consumption. In 1978, about 2.82 gallons of absolute alcohol were consumed per year per person 14 years of age and over. The objectives focus instead on containing past trends toward significant rates of increase in consumption, while aiming to reduce the numbers of young adults and adults who are heavy drinkers and frequent users of drugs.

- By 1990, per capita consumption of alcohol should not exceed current levels.

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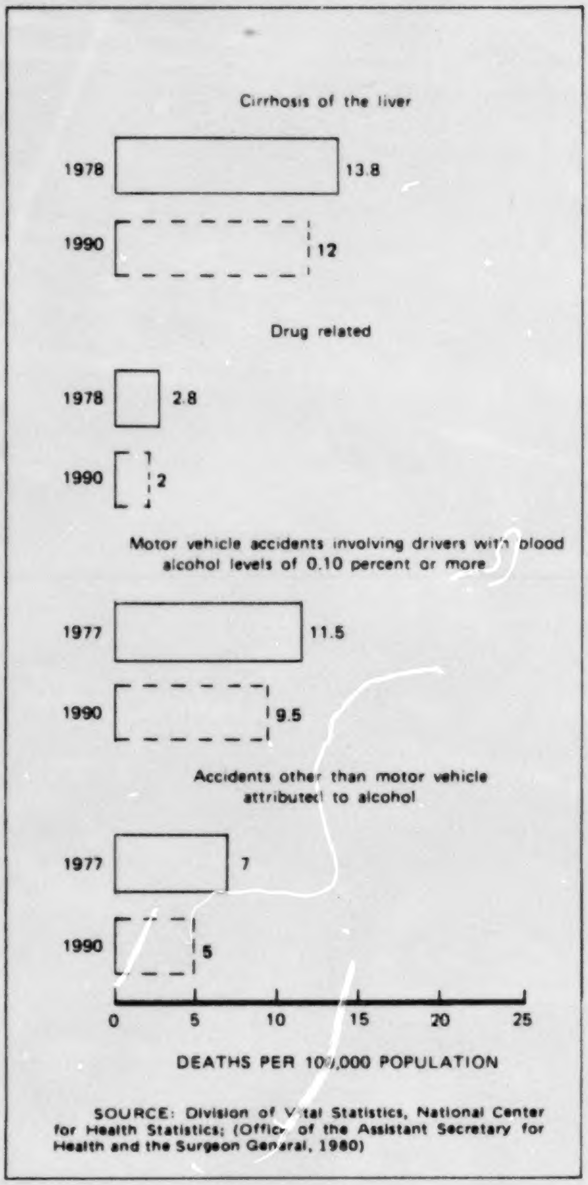

SOURCE: Division of Vital Statistics, National Center for Health Statistics; (Office of the Assistant Secretary for Health and the Surgeon General, 1980)

Figure 35. Reduce mortality related to alcohol and drug abuse

- By 1990, the proportion of adolescents 12-17 years of age who are not using[3] alcohol or other drugs should not fall below 1977 levels. (In 1977, it was 46 percent for alcohol and a range for other drugs from 89 percent for marijuana to 99.9 percent for heroin.)
- By 1990, the proportion of problem drinkers among all adults 18 years of age and over should be reduced to 8 percent. (In 1979, it was about 10 percent.)
- By 1990, the proportion of young adults 18-25 years of age reporting frequent use[4] of other drugs should not exceed 1977 levels. (In 1977, it was less than 1 percent for drugs other than marijuana and 19 percent for marijuana.)
- By 1990, the proportion of adolescents 12-17 years of age reporting frequent use of other drugs should not exceed 1977 levels. (In 1977, it was less than 1 percent of youths for drugs other than marijuana and 9 percent for marijuana.)

The above objectives focus entirely on death rates and consumption levels. This is because data and information systems are not yet available to quantify and monitor other health and social consequences of the use of alcohol and other drugs. These include deaths and injuries from violence, sexual assault, vandalism and property damage, and the effect of alcohol and drug use on the outcomes of pregnancy and on the health and healthy emotional and physical development of infants and children. A major objective during the decade of the 1980's is to develop a capability to establish and monitor quantifiable prevention objectives in all such areas.

By 1990, too, the public should be more aware of the health risks associated with the misuse of alcohol and drugs. At least 90 percent of women of childbearing age should know about the risk of fetal alcohol syndrome, and 80 percent of high school seniors should perceive great risks associated with alcohol intoxication, marijuana and barbiturate use, and frequent, regular cigarette smoking.

Overmedication, particularly of older people, is responsible for a large burden of iatrogenic illness requiring hospital care. While no definitive data are available on the precise extent of this burden, estimates on the numbers of hospitalizations occasioned by adverse reactions to drugs range from 105,000 to 350,000 admissions per year. To prevent or minimize such reactions calls for a more active role to be played by pharmacists, physicians, and hospitals, both in counseling patients and in maintaining prescription drug profiles. Objectives include the following:

- By 1990, adverse reactions from medical drug use that are sufficiently severe to require hospital admission should be reduced to 25 percent fewer such admissions per year. (In 1979, estimates range from approximately 105,000 to 350,000 admissions per year.)
- By 1990, pharmacists filling prescriptions should routinely counsel patients on the proper use of drugs designated as high priority by the

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[3] A person is defined as not using alcohol or other drugs if he or she has never used the substance or if the last use of the substance was more than one month earlier.

[4] "Frequent use" means the nonmedical use of any specific drug on 5 or more days during the previous month.

Food and Drug Administration, with particular attention to prescriptions for pediatric and geriatric patients and to the problems of drinking alcoholic beverages while taking prescription drugs. (Baseline data unavailable.)

- By 1990, standard, good medical and pharmaceutical practice will include drug profiles on 90 percent of adults covered under the Medicare program and on 75 percent of other patients with acute and chronic illnesses being cared for in all private and organized medical settings. (Baseline data unavailable.)

Nutrition

The concept that good nutrition is related to good health is widely accepted. As was noted in section III, many Americans are making an effort to control their weight and in some way to change their habitual patterns of food choices and consumption.

Controversy among scientists about the extent to which cholesterol, fat, and salt constitute risk factors for heart disease and to which fat constitutes a risk factor for certain types of cancer makes agreement on prevention objectives in this area difficult to achieve. The conservative solution is to provide consumers and health professionals with the best information currently available about both clearly established and suspected risk factors as the basis for reaching their own decisions in particular cases. Thus a major set of objectives to be achieved by 1990 is to increase knowledge of both known and suspected diet and health relationships.

Related objectives include labeling food products with accurate information so that consumers can make food choices that conform to diets recommended by their physicians or by nutritionists or that are in accord with national dietary guidelines.

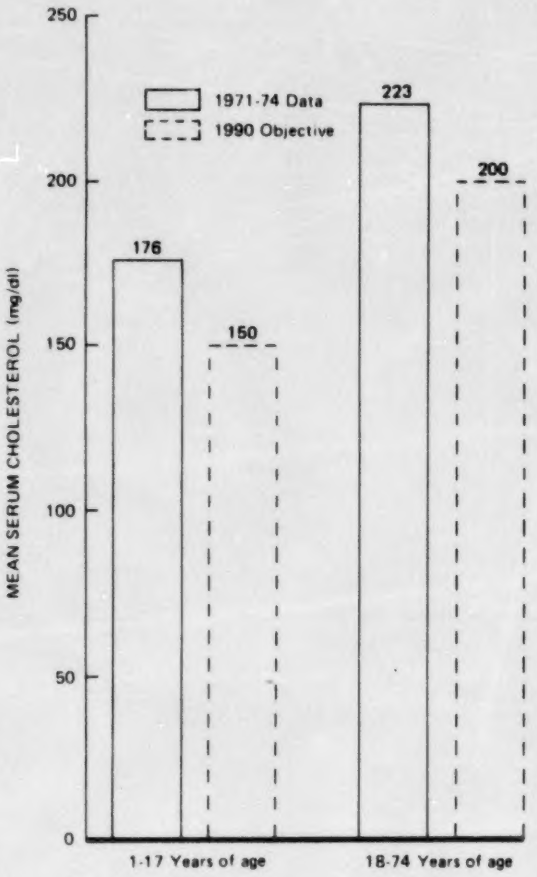
Obesity is considered to be a risk factor for several diseases; thus a major set of objectives concerns lowering the prevalence of overweight in the population. In addition, by 1990, 50 percent of the overweight population should have adopted weight loss regimes combining an appropriate balance of diet and physical activity.

Several specific nutrition objectives relate to the prevention of particular diseases or conditions. Three have to do with decreasing the risks of infant death and poor child health. These objectives are to reduce the proportion of pregnant women with iron deficiency, to eliminate growth retardation of infants and children caused by inadequate diets, and to increase the proportion of women who breastfeed their babies at hospital discharge and at 6 months of age. (Other related objectives are discussed in the section Pregnancy and Infant Health.)

Finally, some objectives concern reducing the risks of cardiovascular disease that are associated with nutrition, as follows:

- By 1990, the mean serum cholesterol level for those 18-74 years of age should be at or below 200 mg/dl.
- By 1990, the mean serum cholesterol level for those 1-17 years of age should be at or below 150 mg/dl.
- By 1990, the average daily sodium ingestion (as measured by excretion) by adults should be reduced at least to the 3 to 6 gram range. (In 1979, estimates ranged between averages of 4 and 10 grams sodium. NOTE: One gram salt provides approximately .4 grams sodium.)

Figure 36 displays the 1979 mean levels of serum cholesterol in the adult and child populations and relates them to the 1990 objectives.



SOURCE: Division of Health Examination Statistics, National Center for Health Statistics: Data from the National Health and Nutrition Examination Survey.

Figure 36. Reduce serum cholesterol levels

Physical Fitness and Exercise

As yet, no data exist to establish clearly the effects of exercise and physical fitness in reducing risks of incurring illness. However, sedentary living has been established as one of the factors that increase the probabilities of cardiovascular disease. Regular physical activity is valued for providing a general sense of well being. Also, people with weight problems who exercise regularly are able to maintain their desired weight more easily. For all these reasons, opportunities for a lifetime of regular physical activity is a general objective to be sought during the 1980's. This means that public recreation departments and interested private agencies that sponsor physical activity programs should include the development of physical fitness and sports skills for all age groups. In addition health professionals should encourage their patients to engage in appropriate exercise.

Physical fitness objectives include increasing exercise participation by people of all ages. The following objectives are sufficiently measurable to be included for tracking:

- By 1990, the proportion of children and adolescents ages 10 to 17 participating in daily school physical education programs should be greater than 60 percent. (In 1974-75, the proportion was 33 percent.)
- By 1990, the proportion of adults 18 to 65 participating regularly in vigorous physical exercise should be greater than 60 percent. (In 1978, the proportion who regularly exercised was estimated at over 35 percent.)
- By 1990, 50 percent of adults 65 years and over should be engaging in appropriate physical activity, e.g., regular walking, swimming, or other aerobic activity. (In 1975, about 36 percent took regular walks.)

As part of these general goals, the increased participation of women, minority populations, handicapped people, inner city and rural residents, and people of low socioeconomic status should be especially encouraged, particularly where their usual occupations do not involve them in physical activity. As one means to this end, by 1990, the number of large employers and corporations (more than 500 employees) who offer fitness programs should be greater than 25 percent.

In order to monitor the effects of exercise on the health of the population and its demographic subsets, as well as on job performance and health care costs, a major objective to be attained by 1990 is to develop methods of evaluation.

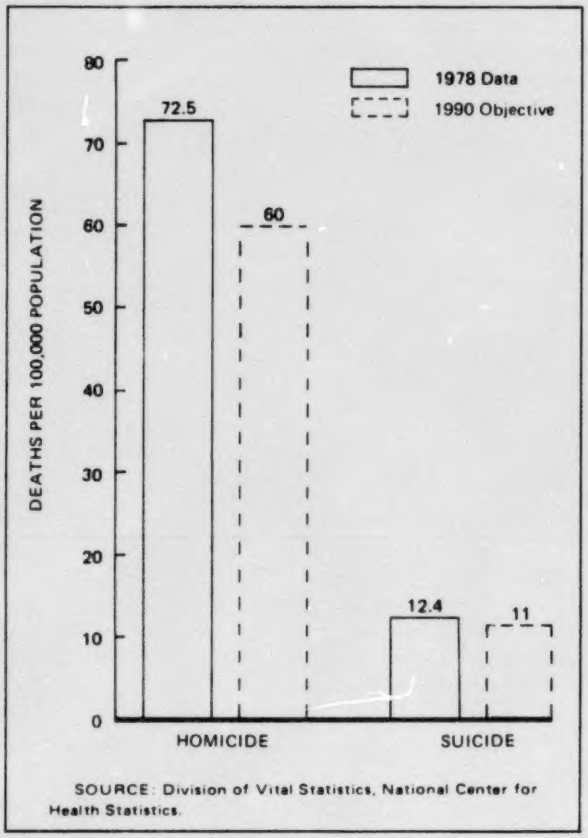
Stress and Violent Behavior

Americans perceive excessive stress to be a major threat to health. Unfortunately, there has been a paucity of research to confirm, negate, or explicate the relationship. The most tragic manifestations of unmanaged stress are death rates from homicide, child abuse and neglect, and suicide. Measurable objectives for reducing these rates during the 1980's are as follows:

- By 1990, the homicide rate among black males 15-24 years of age should be reduced to below 60 per 100,000. (In 1978, it was 72.5 per 100,000.)
- By 1990, the suicide rate among people 15-24 years of age should be below 11 per 100,000. (In 1978, it was 12.4 per 100,000.)

Figure 37 provides a framework for tracking progress toward these objectives.

Another major objective is to reduce by at least 25 percent the cases of children's injuries and deaths inflicted by abusing parents. Estimates vary from



SOURCE: Division of Vital Statistics, National Center for Health Statistics.

Figure 37. Reduce homicide rates among black males 15-24 years of age and suicide rates among all persons 15-24 years of age

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200,000 to 4 million cases of child abuse occurring in the United States each year.

Poorly managed stress is also associated with cardiovascular disease, with work-related and home accidents, and with many forms of mental illness.

As already noted in so many other areas of prevention, progress in both measuring the effects of stress and improving its management is severely impaired by lack of data and lack of research activity. Thus major objectives for the 1980's are to expand the sources of data and in other ways to increase the knowledge base.

Summary and Discussion

This section has summarized a series of objectives for reducing the burden of avoidable illness and disability that are feasible for the Nation to attain by 1990, given the level of knowledge and resources available at the beginning of 1980. The objectives deal with high blood pressure control, family planning, pregnancy and infant health, immunization, sexually transmitted diseases, toxic agent control, occupational safety and health, accident prevention and injury control, dental health, surveillance and control of infectious diseases, smoking, misuse of alcohol and drugs, nutrition, physical fitness and exercise, and stress and violent behavior. The prevention objectives in these 15 areas are discrete and narrowly defined. In combination, however, their attainment should allow the United States to reach the broader national goals for measurably improving the health of its people in the five major life stages as set forth in *Healthy People* (OASH-SG, 1979a).

Lack of baselines against which to track trends during the 1980's limits the number of objectives that are presently measurable. However, as new sources of data become available in future years, more prevention indicators can be added.

In reviewing this nascent *Prevention Profile*, two general points need to be discussed. The first concerns the wide scope of the objectives relevant to prevention; the second concerns the nature of the particular objectives included in the tracking system.

To advance toward the broad goal of reducing the heavy human and economic costs imposed on the U.S. population by avoidable disease and disability demands action on many fronts. Specific objectives relate to many aspects of environmental protection as well as to changes in people's daily habits of living and in the degree of attention that health professionals and health institutions devote to helping their patients stay well. Employers, school systems, product designers and manufacturers, food distributors, the insurance industry, and many other important groups of American society outside its health system often play crucial roles in preventing unnecessary injury and death and/or in promoting healthier lifestyles. This enormously complicates the task of constructing a tracking system that is sufficiently broad in scope to be relevant to actual efforts and progress in disease prevention and risk reduction.

Securing the necessary data to construct a relevant *Prevention Profile* constitutes another major constraint on the selection of relevant objectives for tracking. By definition progress toward preventing disease or reducing risks can only be followed over time, when good baseline data exist and where such data are likely to be available in the future.

Unfortunately, there is no congruence between the intrinsic substantive importance of any particular objective and the availability of data to make it measurable. As has been noted, for example, no data currently exist to show how many communities and how many people in the United States are likely to be exposed to contaminated ground water during the 1980's from toxic wastes introduced into their immediate environments during the 1950's, 1960's, and 1970's. Nor do we know how many children each year suffer injuries and death from abusing parents. Regardless of the importance that society may attach to prevention in such areas, the absence of data prevents the formulation of measurable objectives. Thus they cannot be included in the tracking system. The reverse side of this coin is that the *Prevention Profile* may include certain objectives that many people might consider only marginally important.

This fundamental imbalance in the elements included in the 1980 *Prevention Profile* can only be remedied by improving capabilities for securing reliable, continuing information of special or emerging importance to the health of the population. To improve the relevance of the tracking system to the major challenges prevention faces today requires data systems that can be used to do the following:

- Determine the incidence of hypertension, heart disease, and stroke.
- Assess the status of hypertension control.
- Determine the impact over time of a range of prenatal preventive measures on the physical and psychological development of infants and children.
- Monitor the extent to which children are currently immunized against childhood diseases.
- Determine the occurrence of a variety of sexually transmitted diseases to provide a basis for preventive strategies in local areas.

- Measure environmental hazards both those of a continuing nature and those resulting from isolated incidents.
- Provide information on concentrations of hazardous agents in air, food, and water.
- Correlate occupational and lifestyle behaviors with health and illness records and use them to assess the extent and distribution of occupational injuries and of cancer and other possibly occupationally related illnesses, including heart disease.
- Monitor trends of common infectious agents not now subject to public health surveillance and measure their impact on health care cost and productivity.
- Review the actuarial experience on differential life expectancy and hospital utilization of smokers and nonsmokers.
- Monitor and evaluate the impact of misuse of alcohol and drugs on health status, accidental injuries, interpersonal aggression and violence, outcomes of pregnancy, and the emotional and physical development of infants and children.
- Detect nutritional problems among especially vulnerable population groups and provide a basis for decisions on national nutrition policies.
- Evaluate the effects of participation in programs of physical fitness on job performance and health care costs.
- Enlarge the knowledge about stress as a risk factor in mental and physical health and the impact of stress management in reducing risks.

In addition, future editions of the *Prevention Profile* will need to track changes in the public's knowledge of risk factors for particular diseases and conditions, the extent to which people are making changes in their lives in efforts to reduce their risks, and their success in maintaining the changes they make. As noted in section III, surveys conducted during the 1970's by the National Center for Health Statistics and by private survey organizations as well as the many surveillance systems maintained by Center for Disease Control and other agencies have already accumulated a good deal of the necessary baseline data.

This report has presented an overview of opportunities for improving health through a variety of approaches designed to reduce the occurrence of those diseases and disabilities for which we have at least some knowledge of how to prevent. It has also outlined the first elements of a system to track measurable prevention objectives that could be attained by 1990. Succeeding reports will demonstrate the rate of progress toward these national objectives.

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☆U.S. GOVERNMENT PRINTING OFFICE: 1981—336-263:7115